USDA UNITED STATES DEPARTMENT OF
AGRICULTURE

FSA
Digitizing Training Manual

Input provided from the states of Nebraska, Kansas, Minnesota

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FSA
GIS Digitizing Manual

Material provided by Nebraska, Kansas, and Minnesota GIS State Offices

This manual is for the CLU Digitizing Trainer, it is a resource to view various materials for training, and reproduce your own state training. This manual has many training templates that you are encouraged to use as a basis to creating materials for your needs.

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Welcome

FSA is dedicated to delivering quality training. The training staff welcomes comments and suggestions about the class materials provided. Users may send additional comments about training to the Training Coordinator, Jessica King.

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The Goal

Our goal is for you to leave the course confident and experienced in the skills presented. You will be able to go back to your county office and apply the Tool Suite to your everyday workload. We plan to meet this goal by offering you:

- Examples from the field
- Opportunity for independent work designed to reinforce the skills you have learned
- This manual, for your in-class and after-class reference
- Other materials for quick reference
- Question and answer sessions
- Discussion of the exercises and how to apply them to everyday work

Training Material

All materials are designed to ensure the most effective learning experience, both in the classroom and on the job.

Training Manual - An in-class and after-class reference. The manual includes a CD that contains PowerPoint presentations for all skill levels. The CD also contains course evaluations, agendas, and reference documents in order to adequately train.

How to Use Your Manual

Use your manual to prepare for classroom training, lectures, and PowerPoint presentations. The manual is also intended to guide you through training sessions within your state.

Training Classes

This manual will provide for the training of these classes. There are training PowerPoints for all of the classes shown below.

- Computer Basics
- Introduction to ArcView
- CLU Digitizing Tool

Computer Basics Course: This course is created for the user who needs some additional information on the computer and operating in the Windows NT environment.

Introduction to ArcView Course: This course is an introduction to ArcView software and is designed to be a building block for the GIS user.

CLU Digitizing Tool Course: The course is designed for the digitizing sites to teach them how to use the Digitizing Tool successfully and learn how to digitize, and edit data.

Example of a Digitizing training session agenda

County Maintenance Site GIS Training – February 13th – 15th, 2001

I.   Introductions
        A. Trainer introductions
        B. Starting and ending times, breaks, informal
        C. Name, county, Windows experience

II.   GIS Introduction

        PowerPoint presentation

III.   Hardware and Software Introduction

        A. Computer parts, contents of box, manuals
        B. Service and Warranty Information
        C. Startup and Shutdown workstation
        D. Software on computer: Office (Word, Excel, PowerPoint, Access, and Outlook)
           ArcView 3.2a, Netscape, Explorer, and FTP software, Easy CD Creator.
        E. Users and Email need to be set up in office.
        F. Explorer (drives, making folders, copying and pasting files)
        G. CD-ROM, CD-RW, diskette, backup tape drive.
        H. Organization of backup CDs
        I. Technical help

           • **Name, phone number, email address**
             Also, FSA GIS Intranet web site - http://dc.ffasintranet.usda.gov/fsagis/default.htm

IV.   Introduction to ArcView

        A. Contents of ArcView box
        B. Contents of binder
        C. Terminology as it relates to the CLU digitizing process.

V.   ArcView Startup

        A. Double-click ArcView Icon
        B. Enter login
        C. Project vs. Theme
        D. Explanation of "Untitled" window: Views, Tables, Charts and Layouts and Scripts.
        E. View1
        F. Discuss extensions
        G. Add FSA CLU Toolbar

VI.   Begin Digitizing

        A. Navigating in ArcView, Main ArcView toolbar
        B. Polygon and Split Polygon tools

C. Inclusion, Circle-inclusion, Adjacent and Combine polygon tools ("Delete lines by Combining")
D. Right-click menu
E. Vertex Edit tool ("Double-click for anchors")
F. Saving work, backing up, shutting down workstation

VII. Enter attributes, snapping, quality control tools
A. Search/query tool
B. Attribute tool, two acreage entries, land coverage attribute, auditing
C. Using table, explain fields
D. Quality controls, delete graphic, time involved, practice, ("General snapping fixes a lot of errors")
E. Set snapping
F. Interactive and general snapping use
G. Wetlands layer
H. CRP table
I. Digitizing tips
   1. digitize outside-in
   2. .sbn and .sbx files potential problem
   3. entering farm and tract attributes before drawing fields

VIII Labels, layouts and printing

A. Multi-label tool
B. FSA Layout tool
C. Only one printing option for moment

IX Policies and Standards

A. Read "Nebraska Digitizing Standards"
B. 8-CM draft
C. Discuss "Steps Required to Convert Official Acreage to GIS Acreage"
D. Issues – Multitracts, pivots, chairhooked fields

CLU Digitizing Tool Quick Reference

USDA

CLU Digitizing Tool Quick Reference

Creating and Editing Functions

Creating a new CLU

Add Polygon p.23

Splitting a Tract, Farm or Field

Split Polygon p.23

Adding an adjacent Common Land Unit to a Tract, Farm or Field

Add Adjacent Polygon p.23

Making a boundary change or Moving a Fence Line

Vertex Editor p.23

Deleting a Tract, Farm or CLU

Delete Land Unit p.25
(Be careful! This should ONLY be used when there is no alternative, such as combining fields)

Adding a Pond or Structure

Create Inclusion p.25

Adding Center Pivot Irrigation

Create Circular Inclusion p.26

Combining of Two or More CLUs

 Combine Land Units p.26

Attribution Changes Only

Changing a farm number and/or a tract number on multiple CLUs

 Change Farm/Tract Number - Mass Attribution p.28

Setting HEL Status on multiple CLUs

 Set HEL Status - Mass Attribution p.29

Changing a tract, farm or field number or HEL status on one selected CLU

 Attribute Land Units p.30

FSA Policy and GIS

Renumber Tract/Field/Farm

Allows user to change farm number, tract number, field number, and HEL status. Ex. Farm transfers back into the county because of a purchase from a farmer in the existing county.

 Attribute Land Units

Changing Field Boundaries

Making a boundary change

 Vertex Editor

Snapping
Snapping Environment
Page 46 -47 (Setting the snap environment)
Definition: *Snapping* – the process of making two features meet exactly at the same coordinate. (Ex: making a vertex of one common land unit match a vertex of another common land unit at the exact same coordinate location)

Acreage Estimates

Viewing the calculated acreage of a common land unit

Quick Acreage Calculator p.31
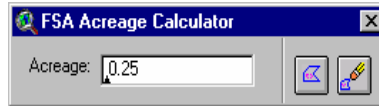
Updating acreage after editing

Update System Acreage p.32

Calculate acreage without making changes to CLU layer

Quick Acreage Calculator

The Quick Acreage Calculator has two buttons that allow the user to "digitize" a boundary and calculate its acreage without making edits to the CLU layer. Select this button, "digitize" the boundary in question, and the acreage will appear in the view. The delete button deletes only these calculations. It does NOT effect the CLU layer.

CLU Digitizing Tool Quick Reference

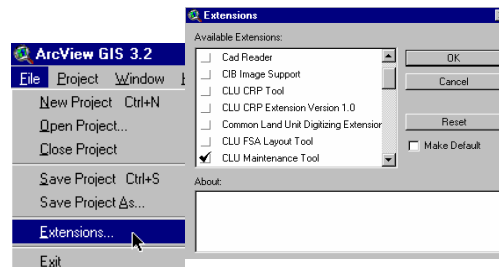# Opening a Project for the First Time:

From the Start Menu

Start Menu → Programs → CLU Digitizing Tool, v5

From the Desktop

Double click on "ArcView" icon
ArcView opens → File Menu → Extensions
Scroll down to the CLU Digitizing Tool extension
Check the box to the left of it to turn it on
CLU Digitizing Tool will now be loaded

CREATING MAPS FOR CUSTOMERS

When a customer comes into a Service Center requesting a map of his or her property, the following steps should be taken:

Find the Tract, Farm or Field in the CLU layer

 (Search CLU and PLSS p.26

After the CLU units are found, they will be selected in yellow. Change the color of the outline and fill of the selected units to "Cyan" using the "Color Palette" in the Digitizing Toolbar.

Zoom to "660 scale" to print

 Zoom to map scale

This button zooms the view to 1:7920 scale, which is commonly referred to as "660 scale" in FSA.

Add labels to map

 Multi-Item Labeler p.32

Use the Multi-Item Labeling Tool to add labels to the view.

Select a Map Template

 Custom Layout

Select from the options on the menu and your layout is created.

Document Conventions

A. Opening ArcView

ArcView CCE-GIS Startup (2001)
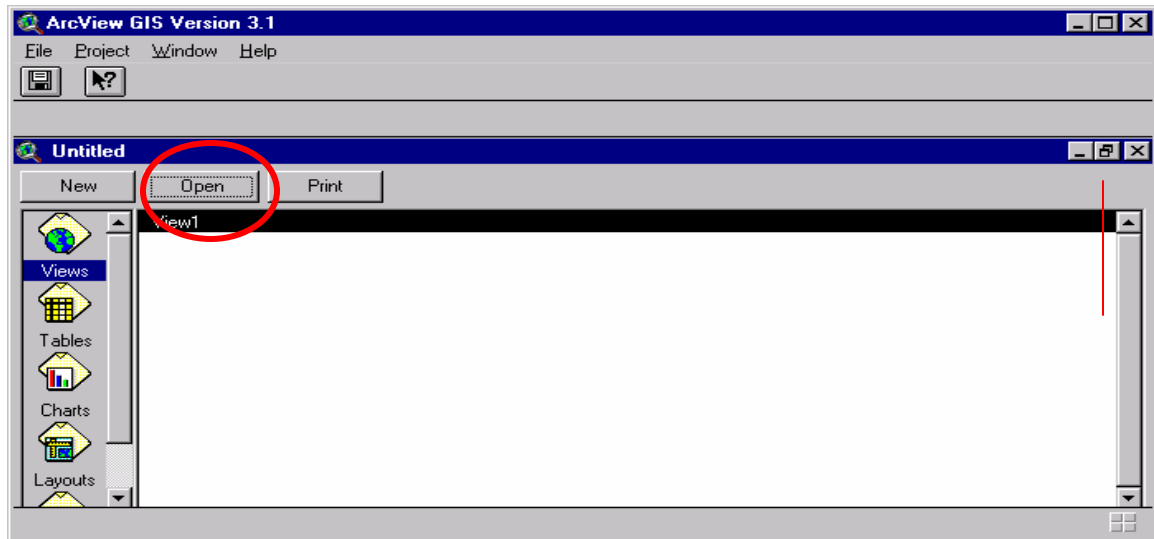### Starting ArcView without a project

1. Logon with username and password.
    Example Login: jjking

2. **Double-click** on the **ArcView icon** on the desktop
    screen.

3. Select "**Open Blank Project**" once ArcView opens.

4. **Maximize** the "**ArcView GIS 3.2**" Window**.**

5. **Maximize** the "**Untitled**" screen. Click on the "**Open**" button.
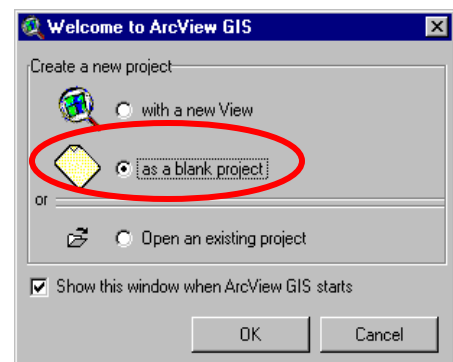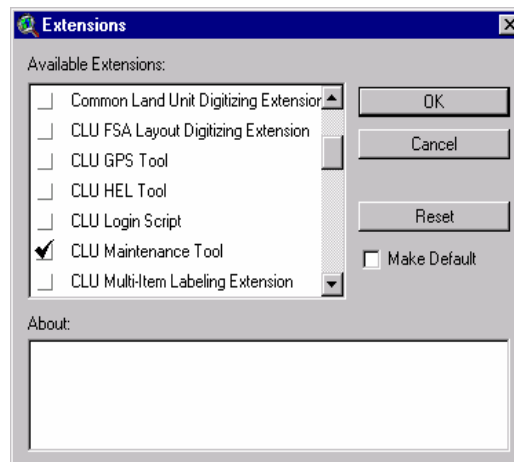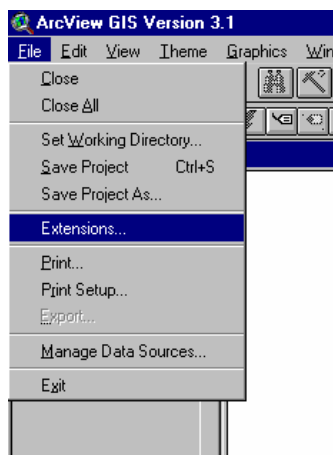
Note: If the tool bar doesn't look like it usually does, the correct extensions have not been added. The Digitizing Tool extension needs to be added manually.

6. Opening Extensions

Go to File → Extensions.
**Check the boxes** "CLU Digitizing Tool"
Check the box "Make Default" so that the extensions will be saved, Click **OK**

This is the only extension that needs to be added manually for the usual ArcView functions. All other extensions that are needed will add automatically with the CLU Digitizing Tool. Other extensions will be added when needed.

7. Login

Every time ArcView is opened with the Digitizing Tool loaded a window will come up asking for a login. **The Login has changed; it now uses your Windows NT Login to identify the user. Choose "Yes" to accept your user name, or choose "No" to change to another users or "Cancel" to exit out of the application.**
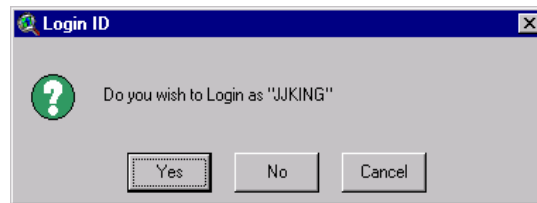
8. Extension Added

Once the extensions are added, the tool bar buttons will show up on the button bar on the ArcView screen. These buttons look like the following.


9. Open CLU Digitizing Tool

To open the CLU Digitizing Toolbar, click on the green button labeled "CLU" found on the ArcView tool bar. The toolbar window will appear and can be moved/dragged anywhere on the ArcView screen where it is needed or is out of the way.

B. Digitizing Tool Guide

1. Creating and Adding Themes

The themes for the county are added at this time. The themes are layers (clu, PLSS, and imagery), that are added to the view so the data for the county can be viewed and used. Click on the "add a theme" button found on the Digitizing Toolbar. A window will come up that will allow themes to be added.
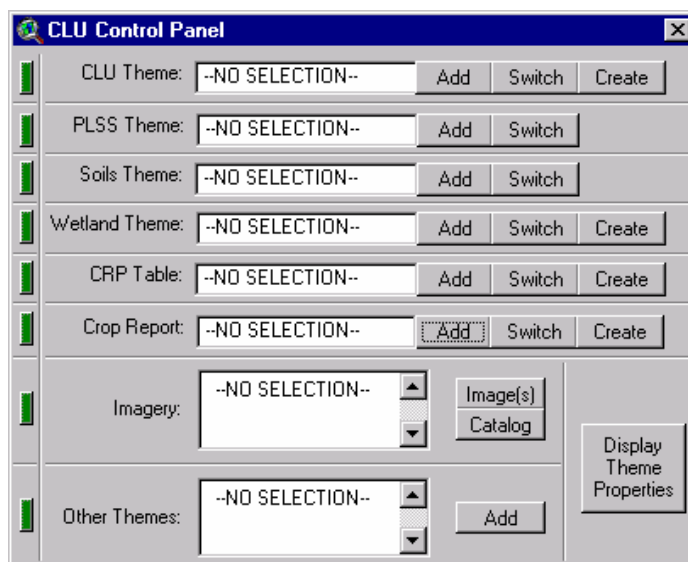
2. CLU Theme
CREATE NEW CLU FILE

Clicking on the **"Create"** button in the CLU Theme box (Figure 3.1) in the Control Panel starts the process of creating a new, empty CLU file. A pop-up window will prompt you for a new CLU file name and directory location.

Choose the correct Drive Letter from the drop-down menu labeled **"Drives."** Then navigate through the **"Directories"** window until you select the correct directory. Finally, type in the appropriate file name in the **"File Name"** window.

NOTE: Make the name unique, since more than one person may be working in a single county. Check with your supervisor for the current file structure format.

After typing in the name, click the **"OK"** button. The file will be created and then added to the legend of your view.
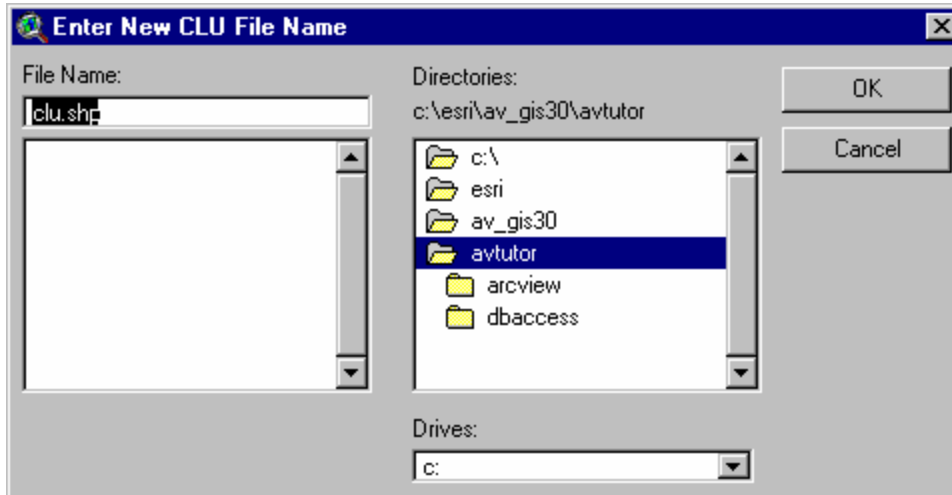
CREATE NEW CRP TABLE
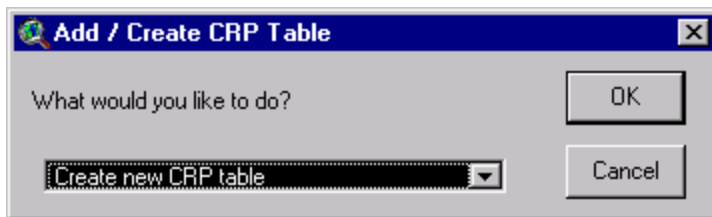
If a CRP table does not exist for the county that is being edited, then choose the option to "**Create new CRP table**" and click on "**OK**". This will open up the "Enter State/County FIPS" dialog.
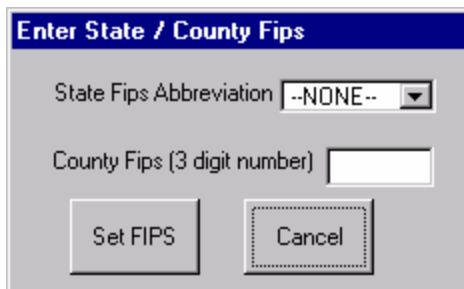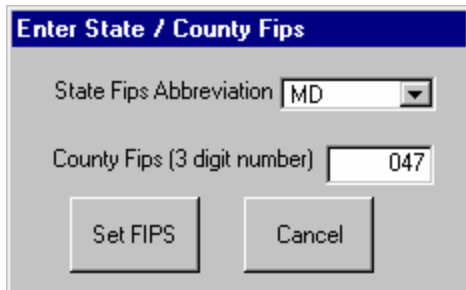
When this dialog opens, please do the following:

- Choose one state abbreviation for the state that is being edited from the drop down list.
- Type in a three-digit FIPS code that corresponds to the county that is being edited.

- Click on "**Set FIPS**" button to create the new CRP table. (the "**Cancel**" button will terminate the process)
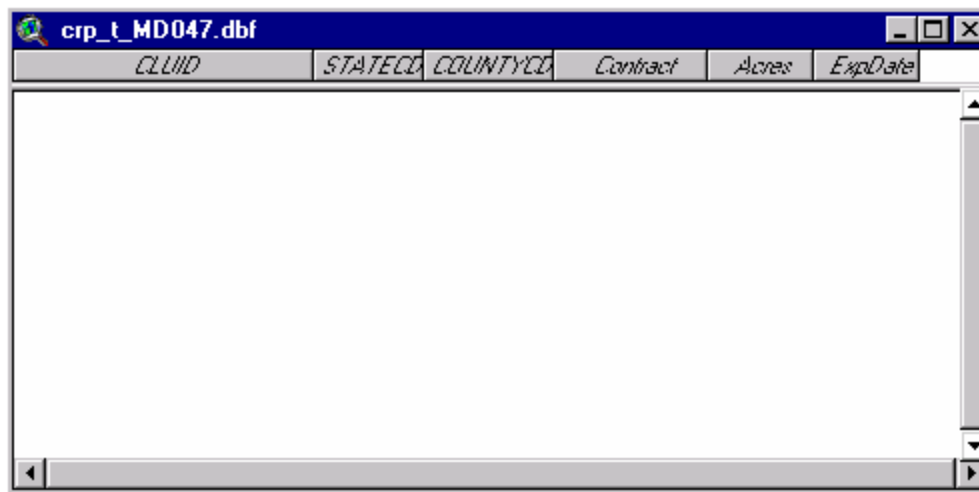
NOTE: Make sure a CLU theme has been selected in the control panel. The CRP tool will not work without this.
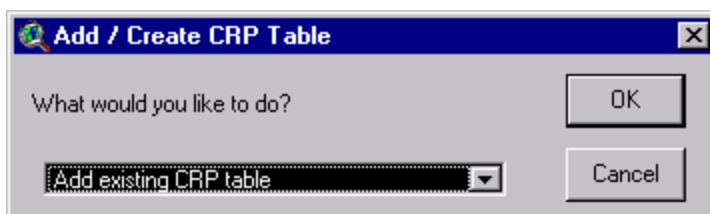
After clicking on the "**Set FIPS**" button, a new table will open on the screen. Notice that the name begins with "**crp_t_**" followed by the two letter state abbreviation and three digit County FIPS number entered in the "**Enter State/County FIPS**" dialog followed by "**.dbf**".

In this example, the user chose Maryland (or MD) for the state and 047 for the county FIPS. Now the new table is named "**crp_t_MD047.dbf**", which is Worcester County, Maryland.

ADD EXISTING CRP TABLE

If a CRP table already exists for the county that is being edited, then choose the option to "**Add existing CRP table**" and click on "**OK**".   This will open up the "**Choose a CRP table to add**" dialog.
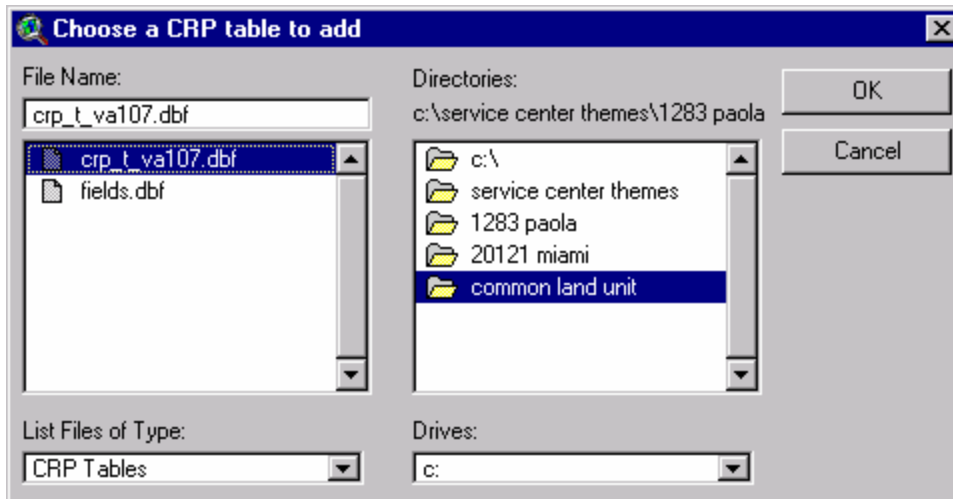
Browse through the directories and select the CRP table to add to the current project, then click on "**OK**" (the "Cancel" button will terminate the process).

Once the CRP table has been created/selected you will be able to work with the CLU Maintenance Tool.
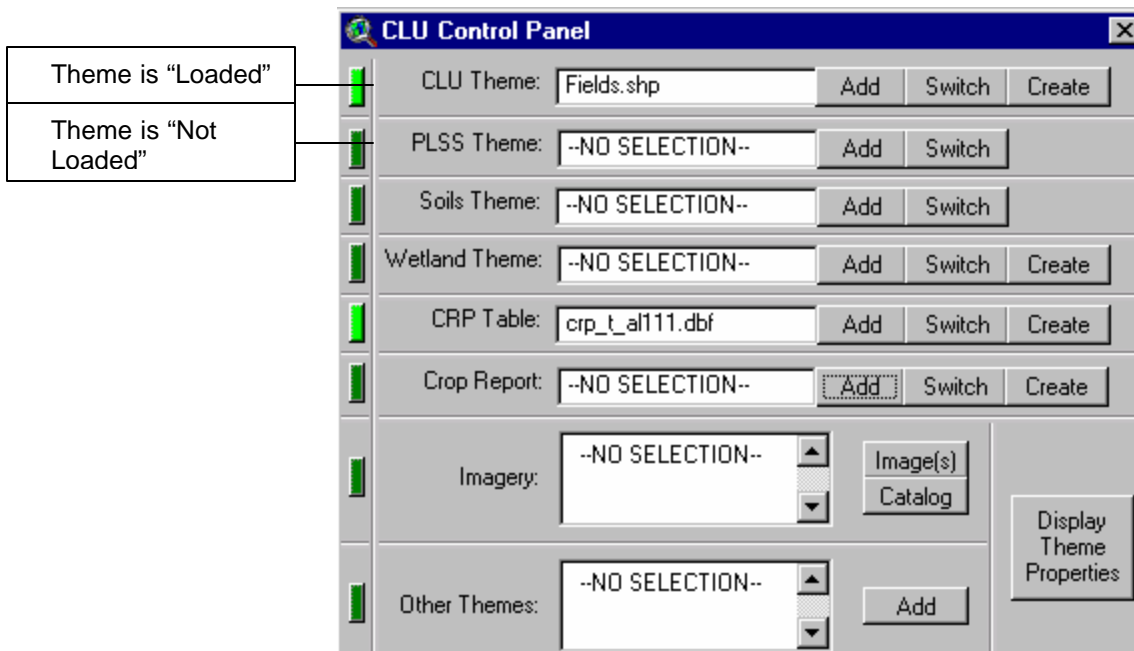
NOTE: The CLU Theme text box now displays the name of the chosen theme. The green lights that correspond to the active themes are now "loaded".

Be sure the View is active before you begin working with the CLU theme.

NOTE: All users must add a CRP table in order to edit their data. Even if no CRP land exists in the county, a table must be created.

3. Adding DOQ Image Data

Click on the "**Image(s)**" button to open the "**Select Imagery**" dialog, which allows the user to choose from individual "**Image File(s)**".

Image File(s)

`Image(s)`

Click on the "**Image(s)**" button to select individual image files to view.
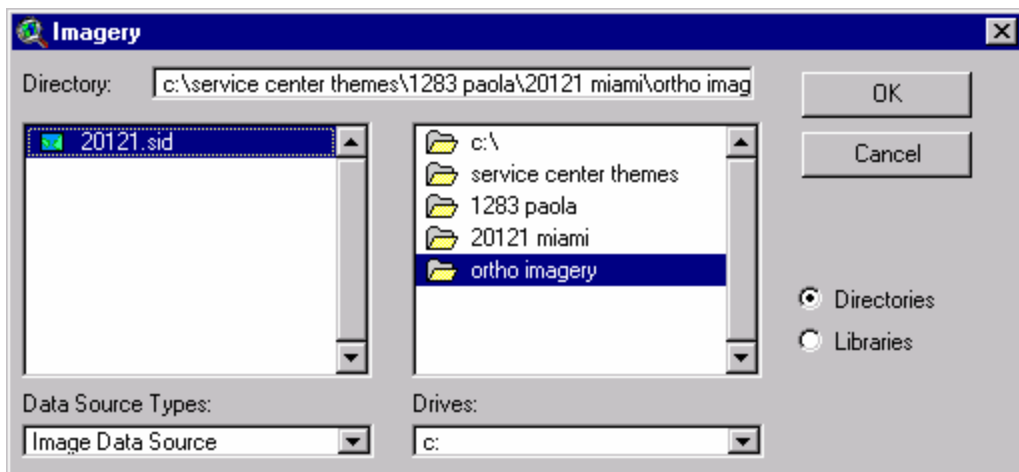
Image Catalog

`Catalog`

Click on the "**Catalog**" button to create a new catalog or to add an existing image catalog. An image catalog mosaics all selected images and loads them into a single theme on the view. The image catalog will only display the portions of the images that fall within the display. Image catalogs are the suggested means for viewing multiple images while working with the Maintenance Tool.
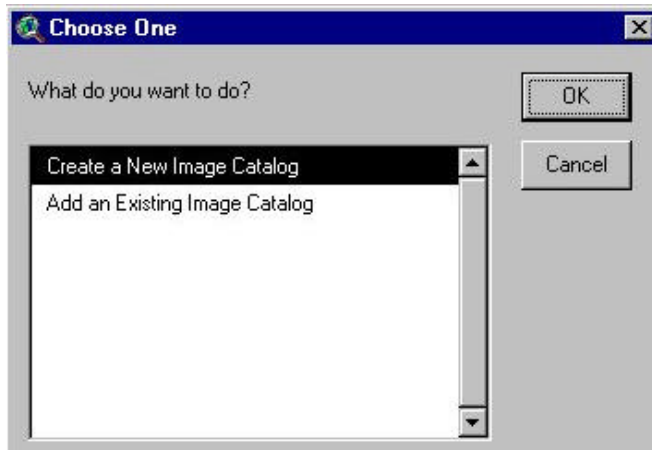
Create a New Image Catalog

If no catalog exists, click on "**Create a New Image Catalog**." Click "**OK**" to begin making an image catalog. A dialog will pop up that asks the user to select a location and name for the new image catalog.
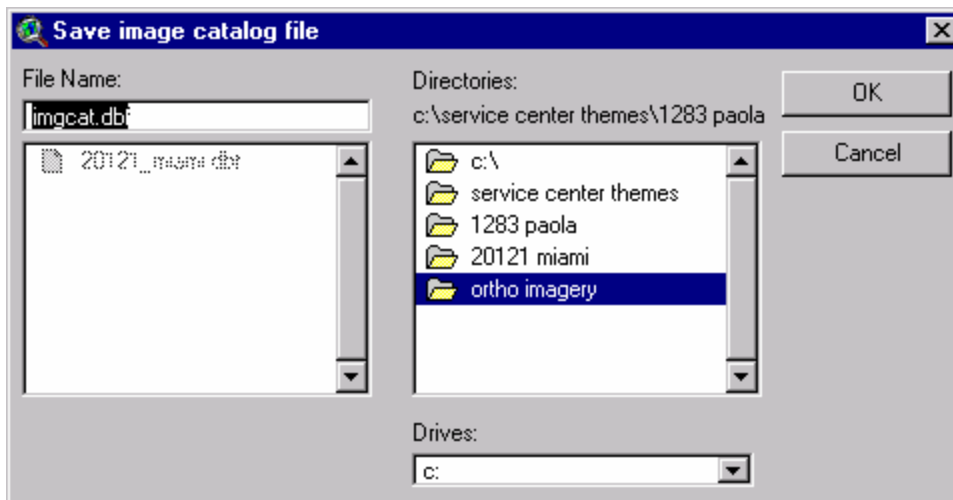
Navigate to the drive where you want to save the catalog, name the catalog and click "**OK**". A dialog will now ask the user to select the directory that contains all of the images that they want to make into an image catalog.
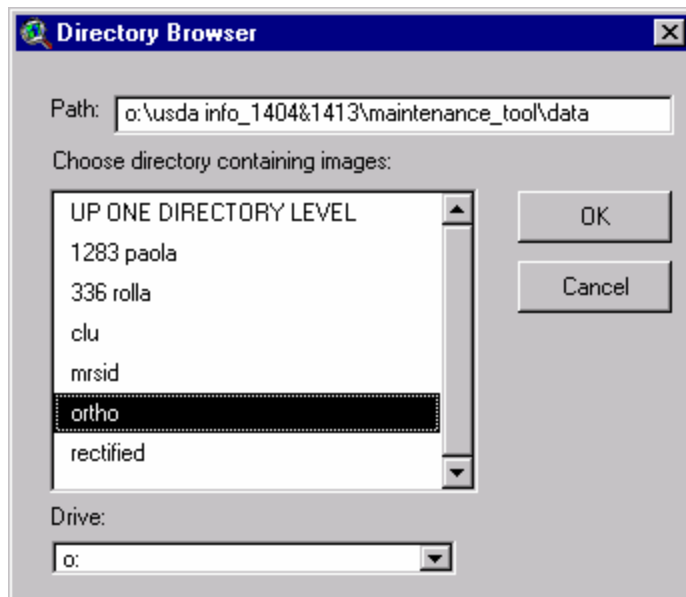
You must select the drive where the imagery is saved. Navigate to the folder that contains the imagery and select it. Click the "**OK**" button to create the image catalog and add it to the current view.

Add an Existing Image Catalog

When "**Add an Existing Image Catalog**" is chosen, a dialog will pop up that asks the user to choose an existing image catalog.
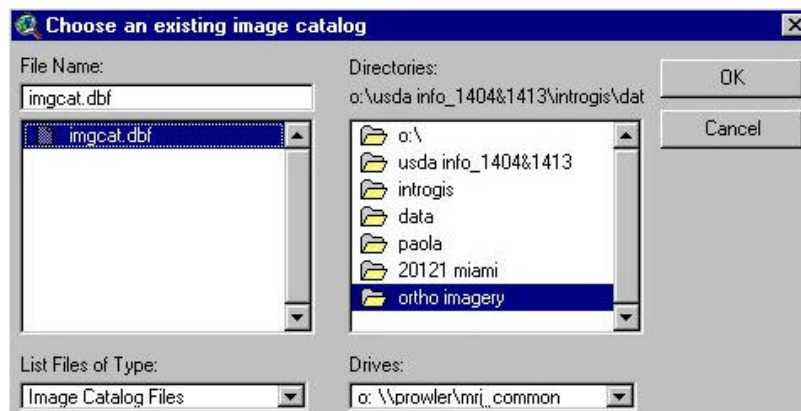
The "**Choose an existing image catalog**" dialog will allow the user to load an existing catalog. Browse for an image catalog and click on "**OK**" to load it to the view. If no catalog exists, click on "**Cancel**."

4. PLSS Theme

Click on the "PLSS Theme" button to open the "**PLSS Theme** " dialog, which allows the users to choose which PLSS theme they wish to view. Browse through the directories and choose the "one" shapefile that you wish to use as your PLSS theme, then click on "**OK**." Not all states have a PLSS layer, and it is not necessary for maintaining the CLU layer. The "**Add**" button allows you to add an existing PLSS layer to your view. The "**Switch**" button allows you to switch the PLSS theme with another theme that is in the view.
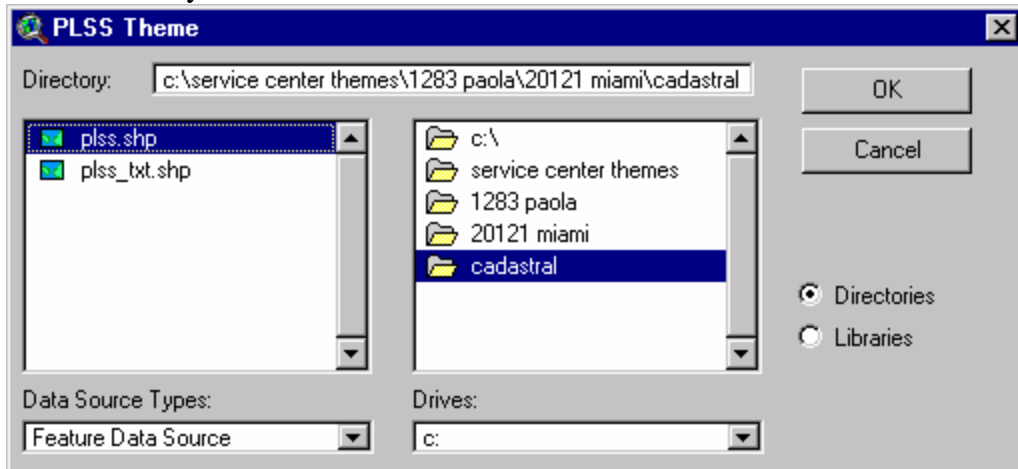
NOTE: The PLSS Theme text box now displays the name of the chosen theme.

5. Viewing Themes

On the left side of the view window the CLU, PLSS, and Ortho/Image themes should appear. In the view window all three layers should be seen. There is a layering order to the themes that have been added to the view. The drawing order for ArcView goes from bottom to top. This means that whatever theme is at the bottom of the theme list will be drawn first and themes are drawn on top of each other as you move up the list.
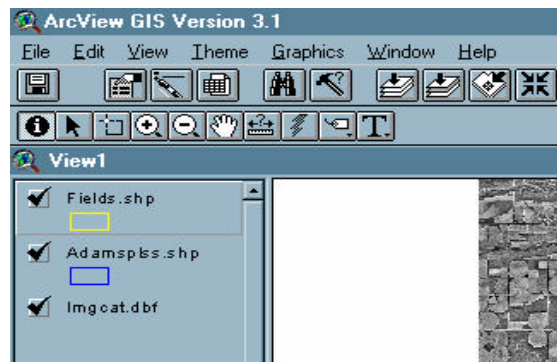
If a project for the county has been made, these instructions will not be needed unless the project is accidentally deleted or will not open. To open a project with all of the needed themes already added, double-click on the project icon on the desktop.

6. DRAWING AND EDITING TOOLS

1   2   3   (see corresponding numbers below)
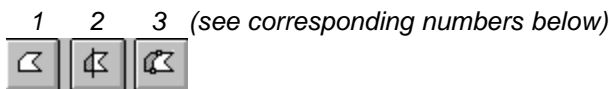
Use these tools to add polygons to your CLU file. When you click on the appropriate draw tool, you will be able to:

1. Draw a polygon
2. Draw a line to split polygon features
3. Draw a line to append a new polygon adjacent to other polygons

When drawing polygons, lines with three or more points, or splitting/appending to a polygon, you must double-click (quickly click the left mouse button twice) when entering the last point to tell ArcView that you are finished entering vertices.

When drawing a graphic on a view or a layout, its dimensions are displayed in the ArcView status bar. On a view, dimensions are displayed in the current distance units of the view (choose **"Properties"** from the **"View"** menu to review). On a layout, the dimensions are displayed in the current page units (choose **"Page Setup"** from the **"Layout"** menu to review).

NOTE: When a new polygon is created, acreage is automatically calculated and stored for that polygon. In the case of a split polygon, new acreage is calculated for each of the two resulting polygons.

NOTE: The Polygon Tool will not allow you to draw a polygon that overlaps an existing polygon. If you draw an overlapping polygon it will clip out any inclusions and snap to any existing polygons.

VERTEX EDIT TOOL

Figure 6.1

Use the Vertex Edit Tool (see Figure 6.1) to reshape a Common Land Unit polygon by moving, adding, or deleting vertices.

To reshape a single polygon or line

Click inside the polygon or directly on a line. Tiny squares will appear along the polygon or line, which are called "vertex handles." Click and hold the left mouse button down on one of the handles. Now, move the mouse to a new location, then release the mouse button. The shape of the object should have changed.

NOTE: Handles appear at every vertex and end point, and are capable of being added or deleted.

To reshape a common boundary between two features

Click directly on the common boundary line of two polygons. "Vertex handles" will appear at each vertex along the shared boundary and "round anchors" will appear at the vertices located at each end of the common boundary.

NOTE: When you move, add, or delete a vertex, both polygons will be changed.

To move a node that is common to a number of features

Click on a node that is common to two or more polygon features. A square "vertex handle" will appear at this node, and "round anchors" will appear on the next closest vertex on each of the polygons. Now when you move the common node, all polygons that share this node will be changed.

To move a vertex

Place the cursor over the vertex you want to move. When the cursor appears as a "crosshair," hold down the left mouse button and drag the vertex to the new position, then release the mouse button.

To add a new vertex

Move the cursor to a position over a line, which is between two vertexes. When the cursor appears as a "target", click the left mouse button to add a new vertex at that exact location.

DELETE LAND UNIT

Figure 6.2

To delete a CLU, select the Delete Land Unit button (figure 6.2), then click on the CLU to be deleted, or if multiple CLUs are being deleted click and drag a box to select more than one unit.

Before they are deleted a message box will appear asking if you want to delete the unit(s) you selected. Choose "yes" or "no".

NOTE: When the user has finished with this operation, the new acreage of the polygon(s) is/are calculated and stored in the table.

CREATE INCLUSION

Figure 6.3

The Inclusion button (Figure 6.3) allows the user to draw a polygon inside of another polygon and then subtracts this new polygon from the original polygon. Farm and tract attributes, as well as acreage are calculated for the new polygons. This is used to remove wetland areas, ponds and other "inclusions" from the field.

NOTE: The Inclusion tool will not allow the user to create an inclusion that crosses multiple existing polygons.

CREATE CIRCULAR INCLUSION

Figure 6.4

The Circular Inclusion button allows the user to draw a circular field inside an existing polygon. The new polygon will clip itself to the surrounding farm boundary if the two boundaries intersect. The acreage in the new polygon(s) is subtracted from the original polygon. For example, this tool can be used to create a CLU field that has circular irrigation.

COMBINE FIELDS

Figure 6.5

Select two or more fields and then press the Combine Fields button (see Figure 6.5 above) to combine them into a single polygon. The tool will calculate the correct acreage for the new polygon and allows you to select the tract and farm from the existing land units.

NOTE: This tool will zero out the "CLU number" fields.

SAVE CLU EDITS

Figure 6.6

ALWAYS save your work. It is good practice to periodically (every 5-10 minutes) save your data file with the save button (see Figure 6.6 above).

SEARCH CLU AND PLSS

Figure 6.7

The Search CLU and PLSS button allows the user to find land units by:

- farm number
- tract number
- field number (CLU number)
- Section/Township/Range numbering (PLSS)

NOTE: To exit the search without performing any searches, click on the X in the upper right corner of the dialog.

This tool allows the user to enter any of the above information to create an initial "New Set" of information. Then, they can select a subset by using another search criteria using the "Sel from Set" button.

For example:
1) Select the "Farm" category.
2) Type in the farm number you wish to search for.
3) Select the "New Set" button to select all CLUs with that farm number.
4) Select the "Tract" category.
5) Type in the tract number you wish to search for.
6) Select the "Sel from Set" button.
Now you should have only the polygons selected that contain BOTH the farm number AND the tract number that you entered. If you wish to have more than one farm or tract number, select the appropriate category, type in the number to add, and click the "Add to Set" button

To use the Sec-Twp-Rng Query, make Sure PLSS Layer is loaded. Enter the data as "numbers only" in the following order with spaces between them: Section first, Township second, Range last. (Example: 36 15 10)

NOTE: PLSS files are not consistent. In some, Township and Range may be text fields with "N" and "E" values included. In these cases the example would be: 36 15N 10E.

The "Locate" function keeps your existing selections while locating and zooming to a new area.

NOTE: If you have examined data using the "Locate" button, you can zoom back to your previous search by using the "Zoom to Selected" button located on the ArcView toolbar. See ESRI ArcView documentation for more details on "Zoom to Selected."

ADDITIONAL NOTE: There is a difference in using the New Set, Sel from Set, Add to Set, Locate and Del Graphic buttons

- The **New Set** button selects all polygons that have the attribution equal to the entered value from the entire file.
- The **Sel from Set** button selects the polygons that have the attribution equal to the entered value from the existing selected features, narrowing the selection.
- The **Add to Set** button selects the polygons that have the attribution equal to the entered value, and adds them to the already existing set, creating a larger group of polygons.
- The **Locate** button finds the polygons with the attribution equal to the entered value, and zooms to the polygon(s) without selecting them. It creates a graphic over the polygon(s) located, which is a different color than the CLU layer, making the located polygon(s) easier to identify
- The **Del Graphic** button deletes the graphics created by the Locate button
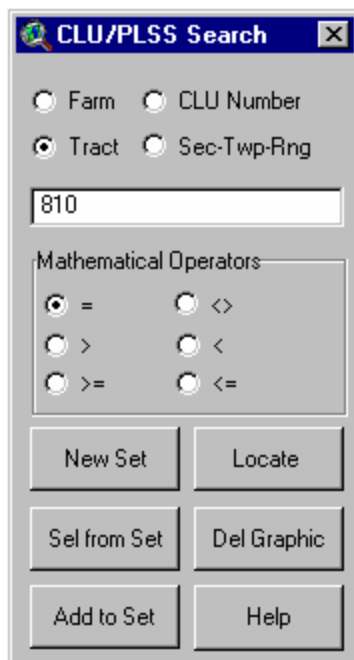
Figure 6.8

TRACT/FARM NUMBERING BUTTON

 Figure 6.9

Select one or more Common Land Units using the "Select Feature" button from the standard ArcView interface. Then click on the Tract/Farm numbering button (see Figure 6.9 above) to add or update Farm and Tract numbers in the tabular data file. The following dialog box (see Figure 6.10 below) will appear, and will allow the Farm and Tract numbers to be entered. These numbers will be added to the tabular data for all of the selected land units.

NOTE: To add only a Tract number or a Farm number, leave the field that you do not want to add data to blank.
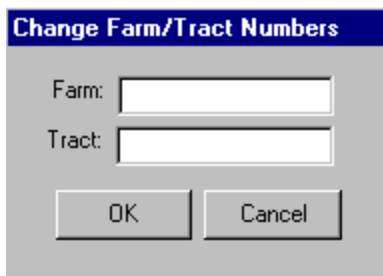
Figure 6.10

LAND USE LAND COVER TOOL

Figure 6.11

The Land Use Land Cover button allows the user to assign a land use code to one or multiple CLUs. Use the "**select**" button on the ArcView Toolbar to select CLUs (hold

Change Land Cover
00 - --NONE--
OK   Cancel

Change Land Cover
02 - Cropland
OK   Cancel

the shift key for multiple units). Once the land units are selected open this tool and select a code from the dropdown menu

You will be asked if you wish to save the update to the number of land units selected. Choose "**Yes**" to save the changes and "**No**" to cancel the procedure.

Final Confirmation

Are you sure you wish to save updates to 62 selected land unit(s)?

Yes   No
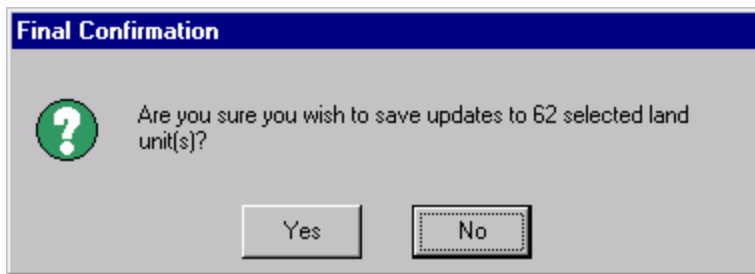
HEL STATUS BUTTON

Figure 6.12

Select one or more Common Land Units and then click on the HEL Status button (Figure 6.12) to add or update HEL status to the tabular data file. The following dialog box (Figure 6.13) will appear, which will allow the user to select the appropriate HEL status (Yes, No, Exempt, or Undetermined) for the selected land units.

Set HEL Status
- ● Yes
- ○ No
- ○ Exempt
- ○ Undetermined

OK   Cancel
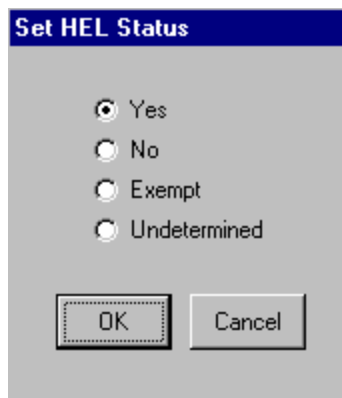
Figure 6.13

UPDATE ATTRIBUTE DATA

Figure 6.14

Clicking on this button (Figure 6.14) will open the following dialog box (see Figure 6.15 below).

NOTE: This box will stay on the screen until you close it.

As you select Common Land Units, the items in the box will display the current attributes attached to the selected land unit. Change the values to the correct values by physically entering them in the appropriate spaces.

NOTE: System acreage is calculated and can not be entered from this screen.

Press **"Update"** to change the values. You can then select another land unit and update the tabular data, or close the form by clicking on the **"X"** in the upper right corner of the box.

This dialog box can be left open while you add new polygons to the system. After adding a new polygon, enter the attributes for that land unit and click **"Update."**

Figure 6.15

QUICK ACREAGE CALCULATOR

 Figure 6.16

Clicking on this button (Figure 6.16) and then clicking on a Common Land Unit will display the calculated acreage for that Common Land Unit polygon (Figure 6.17). This button allows the user to spot check their data entry, comparing the calculated acreage with the source documentation.
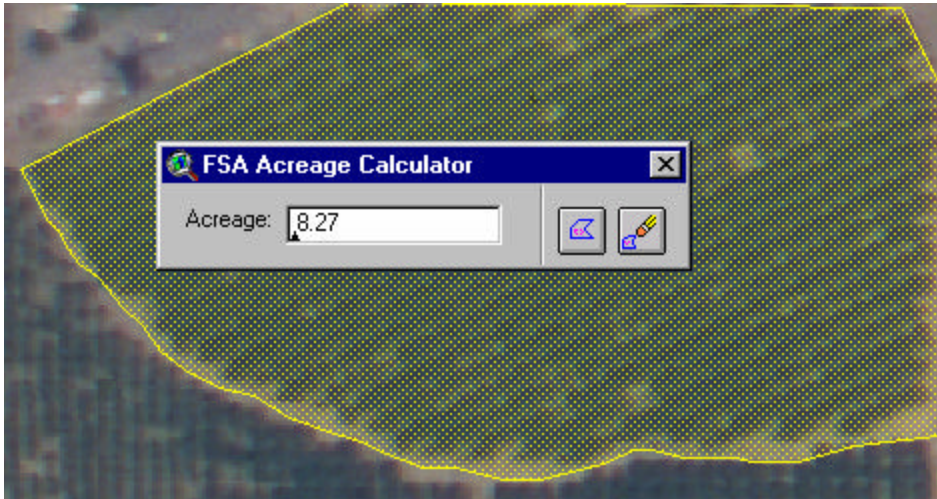
Figure 6.17

The two buttons on the acreage calculator allow the user to draw a line around a polygon to determine the acreage without making changes to the CLU layer (Figure 6.18).
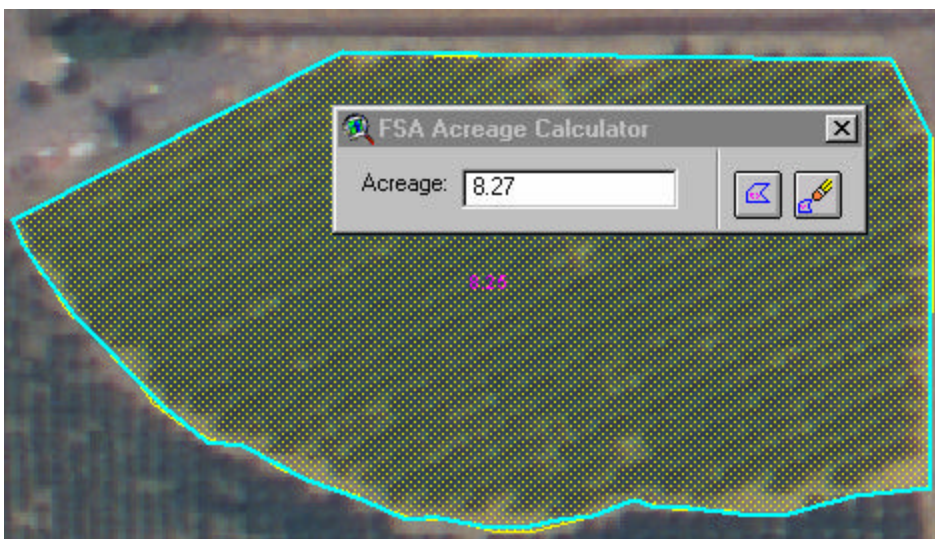
Figure 6.18

The acreage of the drawn polygon is shown on the screen inside the polygon. The second button on this tool erases all of the polygons drawn with this tool.

NOTE: Acreage for groups of polygons can also be calculated. Do this by dragging a box over the polygons you wish to select, or by holding the shift key down while you select polygons using the select key.

UPDATE SYSTEM ACREAGE

 Figure 6.19

Once you have created one or more polygons, click on the "Ac" button (Figure 6.19) to calculate the acreage for each polygon. It will then add that value to the database table. Every time that you click this button, all of the values in the database will be rewritten.

The drawing tools automatically calculate acreage when a polygon is created or modified. This tool can be used to add the calculated acreage to files that were created on other systems, such as *GRASS*.

NOTE: When using data that was created on another system, make sure that the attribute table has the correct 8-CM attributes before trying to work with the file in the CLU Digitizing extension.

MULTI-ITEM LABELING TOOL

 Figure 6.20

The Multi-Item Labeling Tool button allows the user to add and remove text labels from the view. The user can also stack, order, and set preferences on the labels as well.

Click on the Multi-Item Labeling Tool button (Figure 6.20) to open the "Multi-Item Labeler" dialog (Figure 6.21).

 Figure 6.21
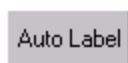
 Figure 6.22

The Auto Label button allows the user to have ArcView automatically place the selected labels in each of the selected polygons (or all polygons if none are selected). When all preferences and label attributes are set, click this button to begin auto labeling.

 Figure 6.23

The Manual Label button (Figure 6.23) allows the user to place labels on the view one at a time manually.

When all preferences and label attributes are set, click this button to begin placing the labels manually. Move the cursor over an individual polygon and click to place the label.
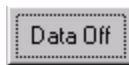
 Figure 6.24   Figure 6.24a

The Set Data button allows the user to change what theme will be labeled and the order in which they will be displayed. Click on the Set Data button (Figure 16.5) to display more options (Figure 6.24). Click on Data Off (Figure 6.24a) to close out these options.
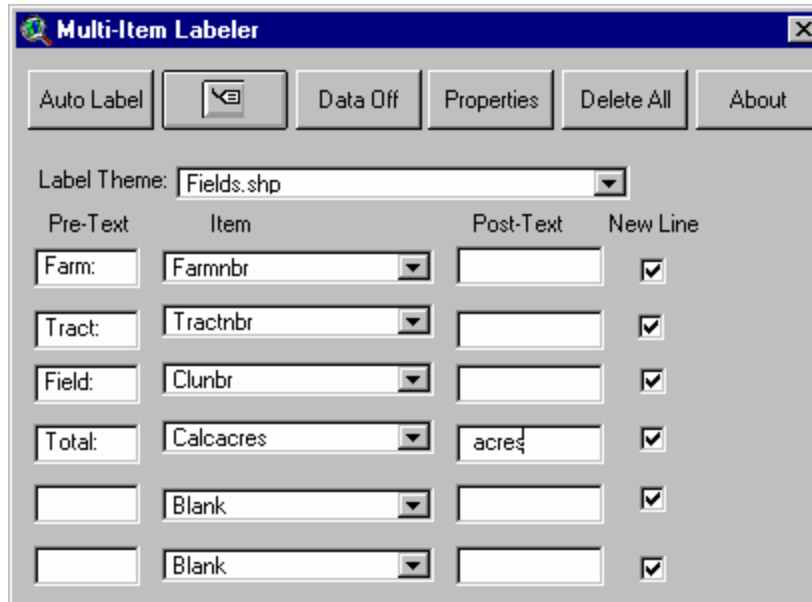
- *Label Theme: Click on the down arrow to choose a theme to place labels on*
- *Pre-Text: Type in a text string that will be placed in front of the label item*
- *Item: Click on the down arrow to choose a label item (ex. Farm or Tract)*
- *Post-Text: Type in a text string that will be placed in back of the label item*
- *New Line: Check off this box if each label should be on a separate line, un-check the box to make the text labels on the same line*
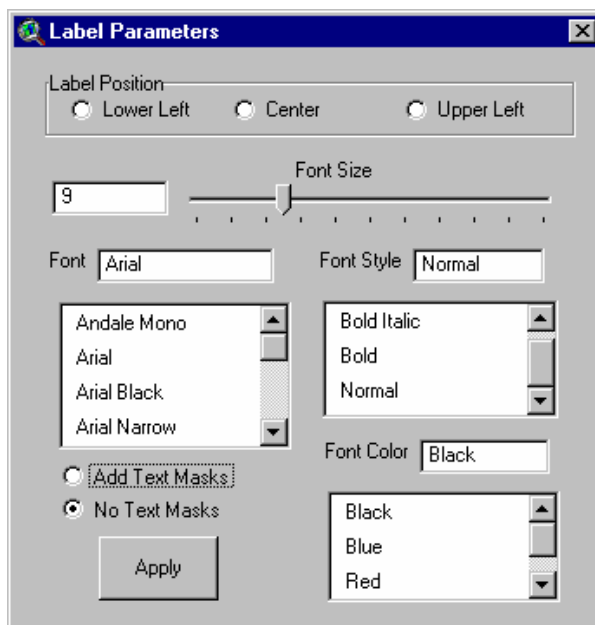
The label would look like this:
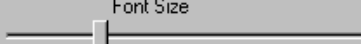

```
Farm: 2
Tract: 10
Field: 2
Total: 20.24 acres
```


The "**Properties**" button allows the user to set or modify the label's text attributes. Click on the "Properties" button to bring up the "Label Parameters" dialog.

Select Label Position

The **label position** is only used for auto-labeling and refers to the position of the text within the polygon. If the text does not fit within the polygon, then a "best" placement is chosen. Manual labeling places the label at the point where the user clicks.

- **Font Size:** Either type in or use the scroll bar to choose the font size
- **Font:** Either type in a font or choose one from the scroll down
- **Font Style:** Either type in a font style or choose one from the scroll down
- **Font Color:** Either type in a color or choose one from the scroll down
- **Text Masks:** Choose to add text masks for a solid fill background around the label or choose not to draw text masks

Click on Apply to set these preferences.

Delete All

The Delete All button will remove all graphics and text labels from the currently selected theme.

About

The About button opens a pop-up, which shows the version and date of release, as well as some contact information.

COLOR PALETTE

The Color Palette button allows the user to change the Fill, Selection, and Outline colors of the selected Themes. The "Semi-Transparent Fill" checkbox can be used to set the fill pattern to a semi-transparent fill, so the imagery can be viewed through the CLUs. The Fill Pattern scale can be used to set the fill pattern to clear or semi-transparent fill so the imagery can be viewed through the CLUs.

Color Palette

	Fill	Selection	Outline
Blue	○	○	○
Cyan	○	○	○
Green	○	○	○
White	○	○	○
Yellow	○	●	●
Red	○	○	○
Magenta	○	○	○
Transparent	●		

Fill Pattern

Dark ———————— Light

[OK]   [Cancel]
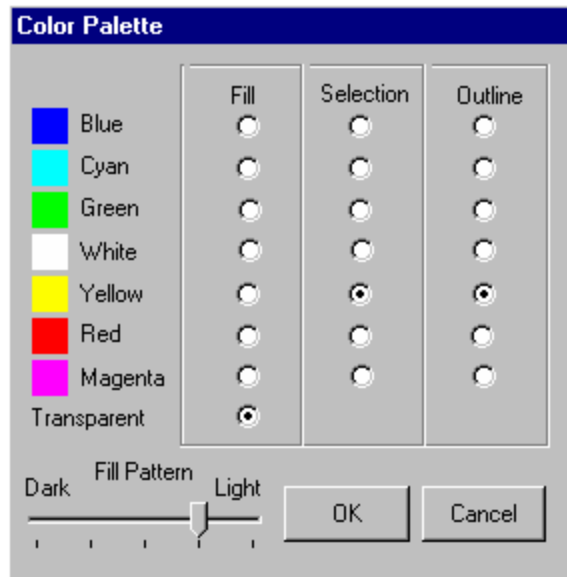
QUALITY CONTROL TOOL

Click on the Quality Control button to open the QC Toolbar.
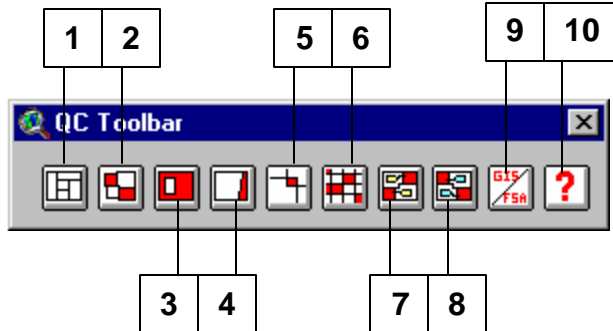
1 – Clean
2 – Shows Multipart Polygons
3 – Void Polygons
4 – Sliver Polygons
5 – Check for Overlaps
6 – Random Selection
7 – Tract/Farm Ratio
8 – Tract/CLU Number Ratio
9 – GIS v. FSA Acreage
10 – About QC Tools

CLEAN POLYGONS

Click on the Clean Polygons button to initiate a process that "cleans" the current polygon theme. After running its course, the routine checks for "NULL area" polygons (polygons that lack all area attribution), and then deletes them. The polygons deleted by the Clean Polygons function do not have visible shapes associated with them, and are usually left over from an ArcView edit function that does not close properly.

SHOW MULTIPART POLYGONS

Click on the Show Multipart Polygons button to initiate a search for polygons that inadvertently cross an existing boundary line in the polygon you are creating (see Figure below). The number 8 is a good example of what these polygons might be shaped like, with two boundaries crossing each other in the middle.

NOTE: The Adjacent Polygon Tool, Combine Polygon Tool, and the Split Polygon Tool **will not** allow you to create this kind of error.

If there are multiple polygons in your data set you will get a small dialog box which gives you a count of the errors (see Figure below). The application will automatically zoom to the first offending polygon. Click on the "Separate" button to separate the current polygon into several polygons.

NOTE: The pieces can now be edited or deleted as necessary.

Then click on the "Next Record" button to move to the next error (until there are no more errors). Close the dialog box by clicking on the "X" in the upper right corner of the pop-up window after all errors are fixed.
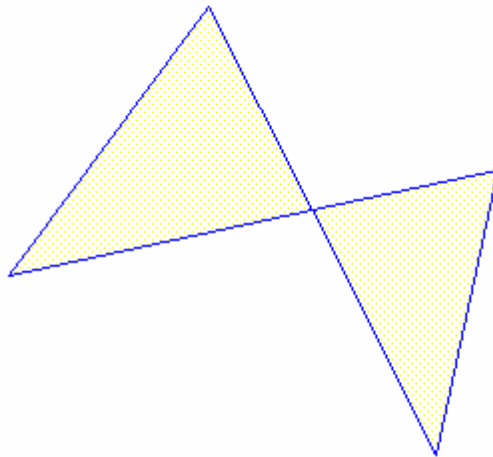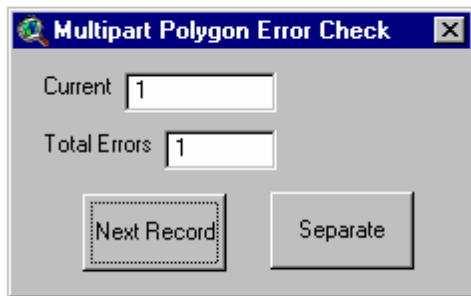
VOID POLYGONS

Click on the Void Polygons button to initiate a search for polygons that contain void areas. Void areas are areas within a polygon created by adding a loop in the boundary as you are creating a new polygon This is similar to the multipart polygon, except that the loop is inside the polygon instead of outside. This creates a "NULL" area inside your polygon.

NOTE: This can usually be corrected by deleting one or more vertices from the void area.

Another type of void error, which this tool **does not** detect, is a doughnut hole within a polygon. This type of error may be caused when you create an inclusion and then delete the inside polygon. Visual inspection should be able to detect this type of error, by selecting all polygons in an area and look for areas where the Digital Orthophoto shows through.

Click on the "Next Record" button until all void areas have been attended to (see Figure 18.3b below). When you have corrected all of the void polygons, close the dialog box by clicking on the "X" in the upper right corner of the pop-up window.
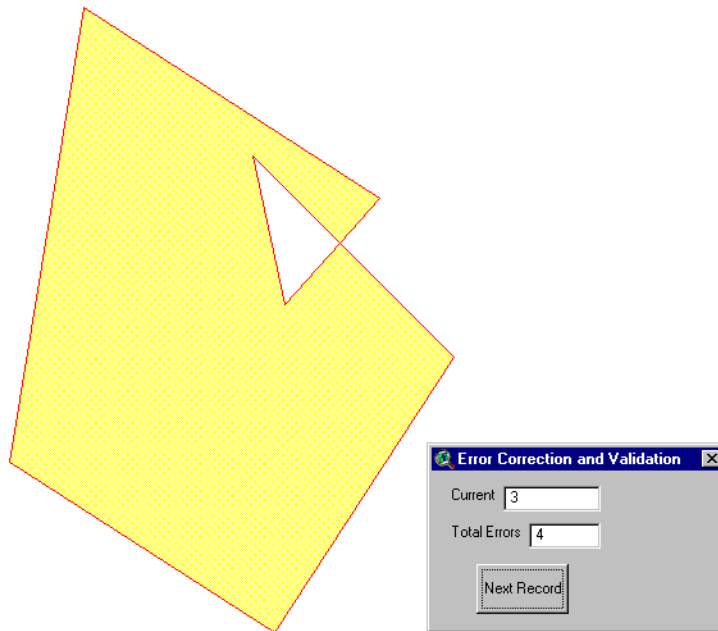
SLIVER POLYGONS

Click on the Sliver Polygons button to initialize the Polygon Sliver Detection Tool. A pop-up window will allow you to enter a "size threshold" (default is .02 acres) for determining possible errors (see Figure below). The tool will then select all polygons that are smaller than this threshold, to be checked and/or verified.

FSA CLU Digitizing Tool

Enter Threshold Size (default is 0.02 acres)   OK

0.02   Cancel
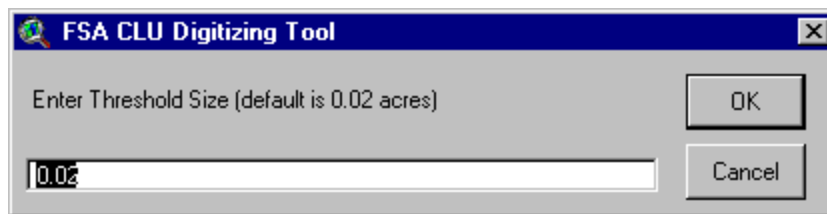
After selecting the polygons, the tool will allow you to cycle through the list and make corrections as necessary. In most cases, these polygons will be combined with adjacent polygons using the combine tool or they may just need to be deleted.

C. Closing and creating backup with ArcView

ArcView CCE-GIS Shut Down (2001)

Shutting down ArcView without a project

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1. Shutting Down ArcView

To shut down ArcView, all of the themes must be deleted and all of the tool bars must be closed out.

2. Selecting Themes to be Deleted

To delete all of the themes from the view, hold down the shift key and click on each of the themes.
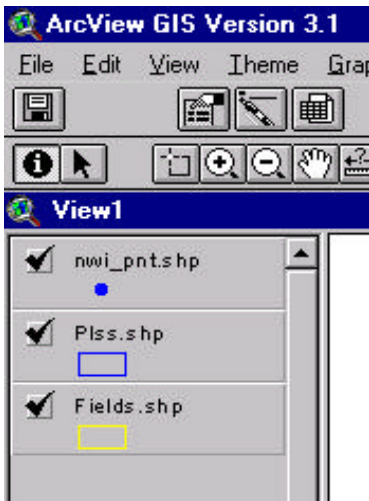
a. Click on **Edit** on the menu bar of ArcView.

b. Click on **Delete Themes**.

c. A window will come up asking if you are sure you want to delete the first theme. **Click** on "**Yes to All**".
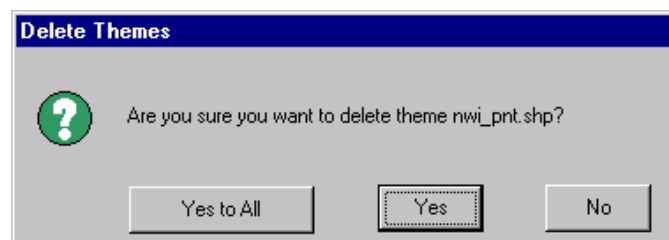
3. Closing CLU Digitizing Toolbar

Close all of the tool bars that are up by clicking on the "**X**" in the top right corner of each tool bar.
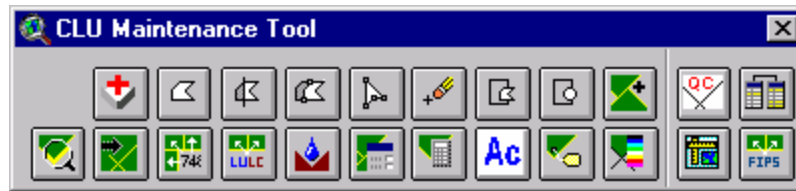
4. Closing ArcView

Close out of ArcView by clicking on the "**X**" button at the top of the ArcView screen. A window will come up asking if you want to save the untitled project. Click on "**No**".
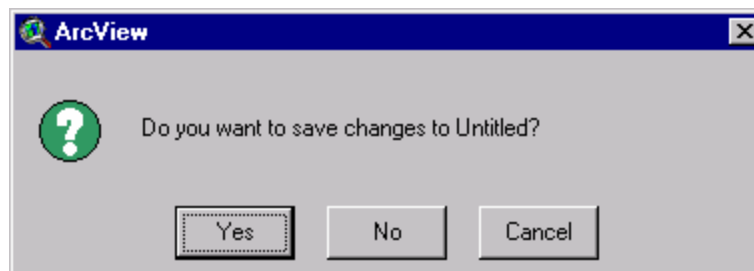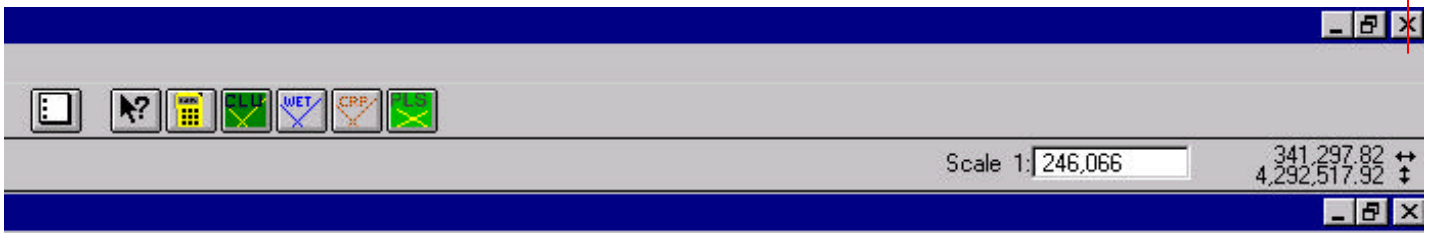
Backing up the CLU

1. Right click on the "**Start**" button on the taskbar.

2. Click on **Explore** to go the explore menu that shows all of the files and applications on the computer.

3. Click on the **C: drive** (The hard drive where you store all your data.) Under the C: drive **double click** on the **Folder**, (where your data is stored.)

There should be files in the (where your data is stored) **Folder**. CLU files, Wetland files, and a CRP file should be found in the folder. There could possibly be extra files with the file extensions *.sbn and *.sbx. Ignore or delete those files.

4. <u>Highlight ONLY FILES</u> with these extensions **shx**, **shp**, **dbf**, To highlight these files hold down the **Control Key and Click on Each File** with the mouse. They will be highlighted in blue when they are selected.

5. Right Click while the mouse arrow is on one of the blue highlighted files. A window will come up with a menu box. **Click** on **Copy**.

6. Navigate to the drive (most likely a drive on your server) where you store your backup.

7. Right Click on the Backup Folder and select **Paste** from the menu window that appears.

Note: The first time that the files are backed-up there will not be data that needs to be replaced. After the first time saving it will ask if you want to replace an existing file. This is usually yes; but always check to make sure that the data of the replacing file is more recent than the file being replaced. If by accident you have been working out of the "common_land_unit" folder instead of the "working" folder you might be replacing your most current file with an older one. It is possible to lose a day's work this way and there is no way to get back your work.

8. Place a <u>re-writable cd</u> in the <u>re-writable</u> drive.

9. Right Click on the selected re-writable drive and **Paste** once more. This will copy the files onto the cd so there will be a hard copy of the files.

10. Once the files have been backed-up, close out of Windows NT Explorer.

D. "Snapping" in ArcView

Adding adjacent polygons in ArcView using the CLU Digitizing Tool can be troublesome when snapping is not being used. It is common to create a polygon that looks like this when it is added to an existing polygon:
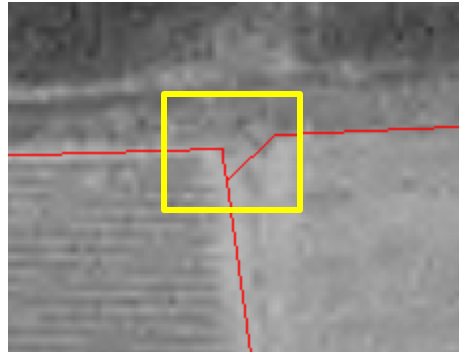
With the use of the snapping environment in ArcView, you can improve how new features meet and align as you create them. When the snapping environment is set, ArcView moves the vertices or line segments of the new features you add to align with the vertices or line segments of other features that are within a specified distance, the "snap tolerance" (as seen in the following graphic).
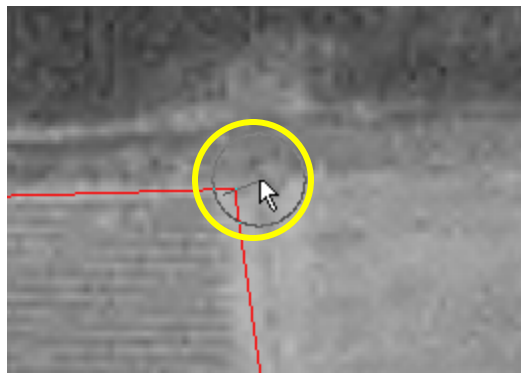
This way, all line features coming together at an intersection will share the same endpoint, and there will be no overshoots or undershoots, and for polygon themes, there will be no gaps or overlap between adjacent polygon features.
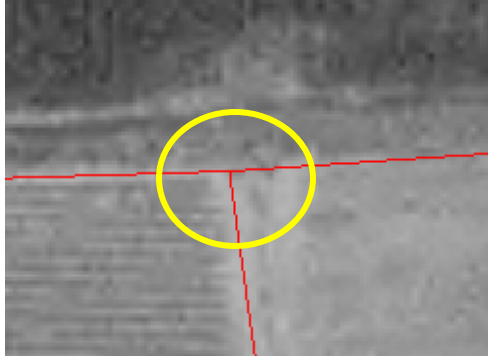
There are two types of snapping: General and Interactive.

General snapping

If you want your features to be automatically snapped to other features within the specified tolerance, set ArcView's general snapping environment. General snapping is feature-to-feature snapping that gets applied as soon as you have added a new feature.

To set the general snapping environment by typing in a tolerance:

1)   Click on the name of the theme you are editing in the view's Table of Contents to make it active.
2)   Click the Theme Properties button.
3)   In the dialog that appears, click the Editing icon to display the theme's editing properties. In the Snapping panel, click the General check box to turn this snapping on. Type a tolerance value into the tolerance field that appears (in this case, 10 feet). Press OK.
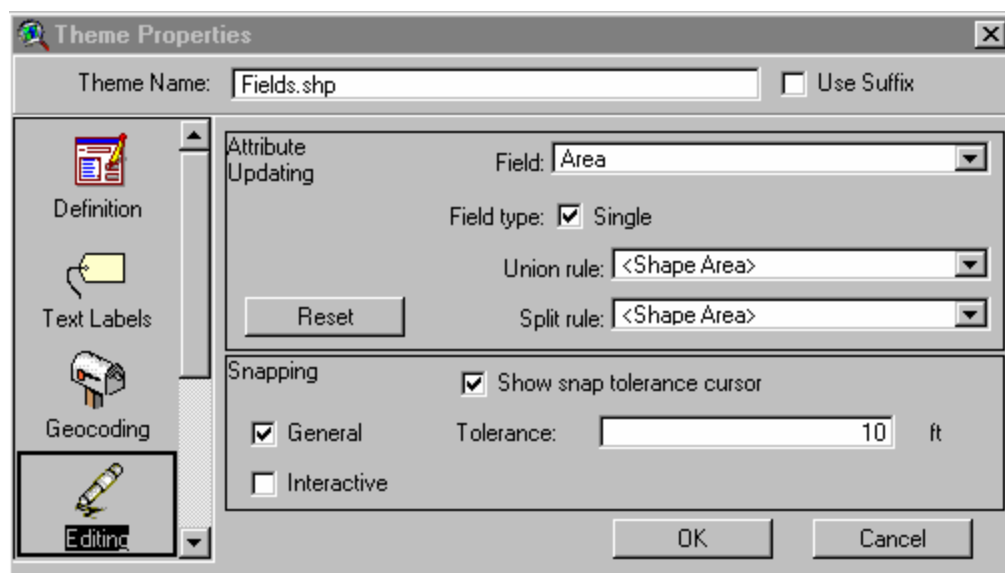
To set the general snapping environment with the mouse:

1)   In the view, hold down the right mouse button to display the popup menu, and
      choose Enable General Snapping from this menu.
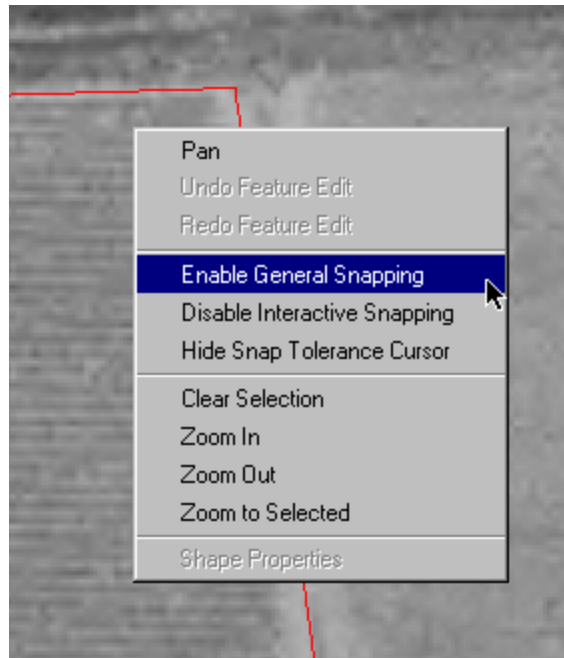
2)   Click the Snap tool palette and in the list of tools that pops down, click the General
      Snap tool. In the view, click and drag out a circle to represent the tolerance
      distance. The radius of the circle is displayed in the status bar. This radius value
      becomes the general snap tolerance.
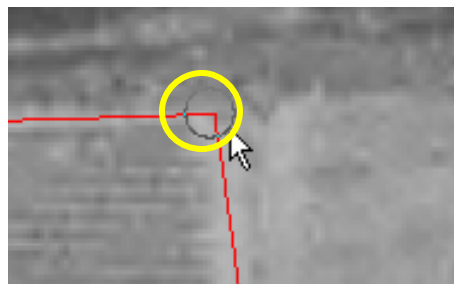
Interactive snapping

For better control over snapping features, use interactive snapping. With interactive snapping, you can apply different snapping rules on a per vertex basis while you are adding a new line or polygon feature. In this way, you will be able to control how each vertex along the line or polygon boundary you are adding is snapped to existing lines or polygons in the theme. You can choose one of the following snap rules from the popup menu while you are adding the feature:

Snap to Vertex: snaps the next vertex to the nearest vertex in an existing line or polygon.
Snap to Boundary: snaps the next vertex to the nearest line segment in an existing line or polygon boundary.
Snap to Intersection: snaps the next vertex to the nearest node common to two or more lines or polygons.
Snap to Endpoint: snaps the next vertex to the nearest endpoint of an existing line (available for line themes only).
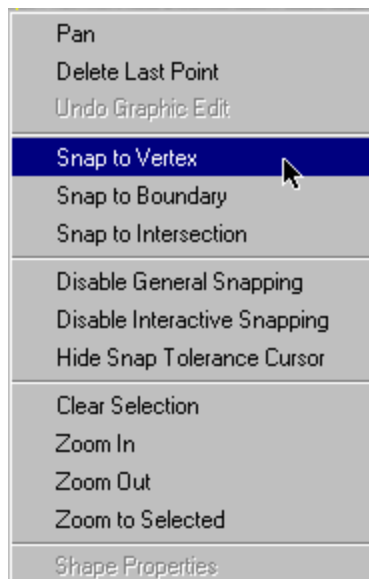
To set the interactive snapping environment by typing in a tolerance:

1)   Make the theme you are editing active, if it isn't already.
2)   Click the Theme Properties button.
3)   In the dialog that appears, click the Editing icon to display the theme's editing properties. In the Snapping panel, click the "Interactive" check box to turn this snapping on. Type a tolerance value into the tolerance field that appears. Press OK.

To set the interactive snapping environment with the mouse:

1)   In the view, hold down the right mouse button to display the popup menu, and choose Enable Interactive Snapping from this menu.

2)   Click the Snap tool palette and in the list of tools that pops down, click the Interactive Snap tool. In the view, click and drag out a circle to represent the tolerance distance. The radius of the circle is displayed in the status bar. This radius value becomes the interactive snap tolerance.

Snap tolerance cursor

When either general or interactive snapping is turned on, you have the option of displaying a circle representing the snap tolerance with the cursor as you create lines, polygons, or edit vertices. This is known as the snap tolerance cursor. If general snapping is turned on, the circle represents the general snap tolerance. If interactive snapping is also turned on, the circle will change to the interactive snap tolerance when you chose an interactive snap rule. By default, the snap tolerance cursor is turned on when snapping is turned on.

To turn the snap tolerance cursor off:

1)   Click on the name of the theme you are editing in the view's Table of Contents to make it active.
2)   Click the Theme Properties button.
3)   In the dialog that appears, click the Editing icon to display the theme's editing properties. In the Snapping panel, click the Show snap tolerance cursor check box to turn this off.   (Note: this checkbox is only visible when general and/or interactive snapping is turned on.)

To turn the snap tolerance cursor off with the mouse:

1)   In the view, hold down the right mouse button to display the popup menu, and choose Hide Snap Tolerance Cursor.

E. Beltrami Merging Procedures:

Initial Set up:

1. Set up projects by township. Create AV projects by township and assign digitizers a township or townships. I create county map in AV and put the initials of the digitizers on the map, print it out, and hand out the maps to each digitizer and keep a copy at my desk. I use the copy at my desk as a record of what has or has not been completed by using a highlighter to mark the ones that have been completed.
2. When the digitizers are digitizing I have them stop at roads or rivers even if they are beyond the township boundaries. The reason for this is to make the final merge as easy as possible, no overlaps.
3. Usually the digitizers add other CLU themes that are adjacent to their project to minimize the chance of overlaps or digitizing areas that already have been digitized. Special Note: If adjacent themes are added, they cannot always be turned on. If a theme is being worked on by another person and the theme is on errors will be created in AV. They can turn them on / off when they are needed and you should not run into any problems.

Final Merge:

1. Start a new AV project.
2. Add all the CLU themes
3. Zoom and Pan around the borders of the townships to make sure there are no overlaps, if there is fix them at this point.
4. Go to File then Extensions, turn on the Geoprocessing extension and press OK.
5. Go to View and select Geoprocessing Wizard.
6. Follow the steps in the Wizard in order to merge all the CLU themes into one.
7. Run your QC tools to fix any mistakes that were overlooked.
4. Send the merged CLU to Salt Lake City followed by an email confirming what you have sent them.

F. Data Naming Structure

STANDARD FOR GEOSPATIAL DATASET FILE NAMING

Overview

The objectives of this standard are to help in managing United States Department of Agriculture (USDA) Service Center Initiative (SCI) geospatial data by establishing directory (folder) and file naming conventions; support the concurrent USDA Service Center Modernization Strategy to develop a basic nationally consistent set of core geospatial data that will provide a foundation on which to base business applications; and to relate to other SCI geospatial standards including SCI Std 003, *Standard for Geospatial Data Set Metadata* [A2][1]*,* SCI Std 005, *Standard for Geospatial Feature Metadata* [A3], SCI Std 007, *Standard for Geospatial Data* [A4], and the *USDA Service Center Initiative Directory Structure and File Naming Convention Change Control Policy* [A6].

This standard contains two appendices. Appendix A provides bibliography references. Appendix B contains the initial directory and naming conventions established for the Business Process Reengineering (BPR) pilot sites.

Scope

The scope of this standard is to define the directory and file naming conventions for the *geospatial dataset collection* (physical repository of data) that resides at a Service Center. This standard shall apply to the set of nationally consistent core geospatial data layers first defined in the *USDA Service Center Geographic Information System (GIS) Strategy* [A5]. It also provides standards on the directory structure and file naming for locally acquired and derived geospatial data. This document replaces the initial directory and naming conventions established for BPR pilot sites known as version 5 (See Appendix B).

Purpose

GIS for the Service Center is expected to comprise nationwide coverage of more than 20 common *geospatial datasets* (a group of similar spatial phenomena) that are collected and distributed at the county level of geography. To organize this data at the Service Center so that it is accessible, maintainable and updateable requires a standard scheme for categorizing the data into directories and establishing names and conventions for the files in the directories.

This standard will continue to evolve as nationally consistent datasets are provided to the Service Centers. However, this document is an initial attempt to identify the directories

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[1] The number in brackets corresponds to those of the bibliography in Appendix A.

and file names for existing common geospatial dataset categories and it helps to establish initial standards and direction for BPR projects that require geospatial data.

This standard will be placed under configuration management and maintained through a structured change control process because the impact of changing this standard can be great on those applications that use the data and those who provide the data. The change control process will allow proposed changes to be reviewed and discussed by those affected by the change.

Nationally fielded applications will be developed that rely on the nationally consistent set of geospatial data. These applications will rely on the integrity of the data in meeting the specifications in this standard. Applications that are built locally for a Service Center or for data that is acquired locally shall adhere to these standards.

Acronyms and abbreviations

BPR	Business Process Reengineering
CCE	Common Computing Environment
CD-ROM	Compact Disc Read Only Memory
CLU	Common Land Unit
DEM	Digital Elevation Model
DLU	District Land Unit
DMF	Digital Map Finishing
DOQ	Digital Ortho Quadrangle
DOQQ	Digital Ortho Quarter Quadrangle
DRG	Digital Raster Graphs
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIPS	Federal Information Processing Standard
FSA	Farm Service Agency
FWS	Fish and Wildlife Service
GIS	Geographic Information System
GNIS	Geographic Names Information System
ISO	International Standards Organization
MDOQ	Mosaicked Digital Ortho Quadrangles
MLRA	Major Land Resource Areas
MrSID	Multi-resolution Seamless Image Database
NAPP	National Aerial Photography Program
NASIS	National Soil Information System
NCGC	National Cartography and Geospatial Center
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OIP	Office Information Profile
RD	Rural Development
SSA	Soil Survey Area
SCI	Service Center Initiative
SSURGO	Soil Survey Geographic Database

STSSAID	State Soil Survey Area ID
TIF	Tagged Image File
US	United States
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
WRP	Wetland Reserve Program

Background

The *USDA Service Center Geographic Information System (GIS) Strategy* [A5] first defined a list of geospatial datasets required to provide a foundation on which to base business applications. The *Geospatial Data Acquisition, Integration, and Delivery National Implementation Strategy Plan* [A1] further refined and expanded this list. This list was organized into logical categories based on business names. It is these logical categories that form the basis for the organization of the physical directory structure defined in this standard.

The SCI Std 007, *Standard for Geospatial Data* [A4] includes a geospatial data model that details a hierarchical classification that shall be used to categorize, or provide taxonomy for, geospatial data. These categories are referred to as *geospatial dataset categories.* This model and classification shall be used to identify and describe geospatial data in a consistent way. The *geospatial dataset categories* in the model are used as the basis for the directory structure in this document.

The top level of the geospatial data model is referred to as a *geospatial dataset collection*. A *geospatial dataset collection* is a catalog and physical repository of *geospatial datasets.* For example, an USDA data mart that serves geospatial data to only one Service Center, or an USDA national data warehouse that serves geospatial data to all Service Centers is a *geospatial dataset collection.*

This standard is based on the lessons learned during the initial fielding of geospatial datasets at the pilot sites (see Appendix B). In addition to creating a flatter directory structure, each dataset name within each geospatial dataset category was examined in order to provide a consistent naming convention that would offer a standard method of dataset identification including name, data type and location. The directory structure and naming conventions resulting from this examination follow in the subsequent sections. The geospatial data model is used as the basis for the directory structure in this document.

Geospatial dataset collection

The entire *geospatial dataset collection* at the top level of the directory shall be located on a designated drive and named "geodata". This replaces the previous top-level directory "Service Center Themes", the sub-directory named according to Service Center Office Information Profile (OIP) number and name, and the sub-directories within that named according to county (see Appendix B). Removing the Service Center and county level sub-directory level simplified navigation but has ramifications on geospatial dataset file naming which are discussed in 0. There shall be only be one "geodata" occurrence in any

given Service Center. The standard directory structure has been reduced and flattened as follows:

```
<disk drive>:
        📁 geodata <geospatial dataset collection>
        📁   <geospatial dataset category (directory/folder)>
        📁 transportation <geospatial dataset category (directory/folder)>
            🖼 roads_l_06067.shp <geospatial dataset>
            🖼   <geospatial dataset>
```
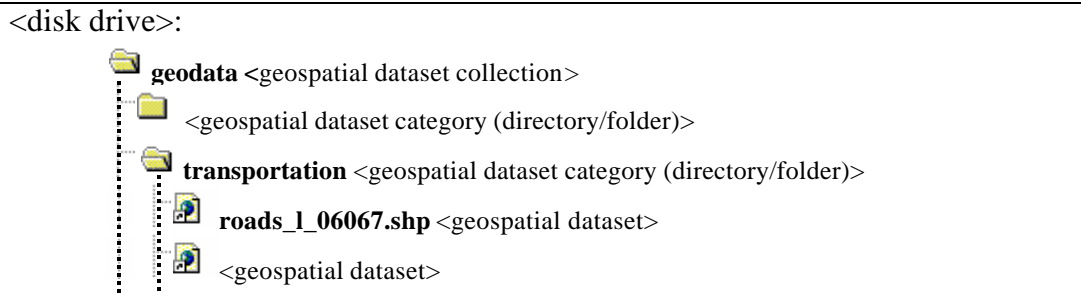
Figure 1—Geospatial dataset collection

An example of the physical path to a road map using this standard on NT would be
        C:\geodata\transportation\roads_l_06067.shp

For UNIX it would be
        /geodata/transportation/roads_l_06067.shp

Geospatial dataset category

The next level in the geospatial data model is a *geospatial dataset category, which* is a logical group or division of a *geospatial dataset collection*. A *geospatial dataset category* is analogous to a computer directory or folder. There can be multiple occurrences of *geospatial dataset* categories under the *geospatial dataset* collection ("geodata") level. A *geospatial dataset category* may include at least one *geospatial dataset* complete with all metadata and feature data including geometry, attributes, labels and symbology. However, an empty directory can exist as a 'place holder' for future data. Additionally, *geospatial dataset categories* are allowed to have sub-directories as in the case of climate.

```
<disk drive>:
        📁 geodata
        📁   <geospatial dataset category (directory/folder)>
        📁 climate <geospatial dataset category (directory/folder)>
            📁 precipitation <geospatial dataset category (directory/folder)>
                🖼   <geospatial dataset>
                🖼   <geospatial dataset>
            📁 temperature <geospatial dataset category (directory/folder)>
```
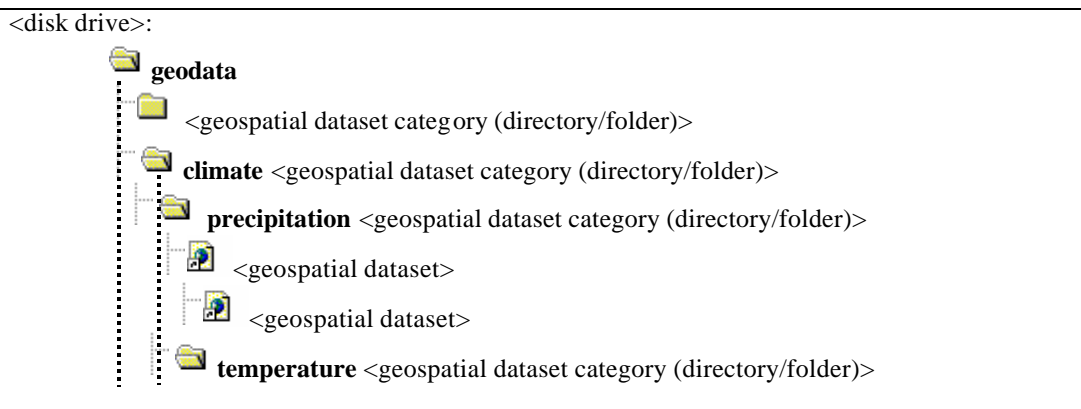
Figure 2— Geospatial dataset categories

Geospatial dataset category naming

In this second level data hierarchy, the physical directory name previously used upper case characters and spaces. In practical applications these two practices cause problems migrating datasets between UNIX and NT platforms. As a result, this standard requires that the physical implementation of the category directory names shall consist of **only** lower case characters "a-z". Additionally, the underscore character "_" shall be used in place of a space in a directory name. Allowable characters are covered in detail in Clause 0.

The SCI Std 007, *Standard for Geospatial Data* [A4] identifies the *geospatial dataset categories* used in this standard. These standard category or directory names are also shown in Table 1. The standard name used for each directory hopefully shall reflect a name that is commonly used and understood by Service Center personnel when referring to the *geospatial dataset category*. For example, *geospatial dataset categories* include common_land_unit, ortho_imagery and soils (See Table 1).

Geospatial dataset

A *geospatial dataset* is a group of similar spatial phenomena in a *geospatial dataset category* and is related to one metadata set. A *geospatial dataset* is often referred to as a layer, theme, coverage, or simply a map. For example, the *geospatial dataset category* hydrography could contain the *geospatial datasets* surface water, water control infrastructure and flood hazard maps. The surface water *geospatial dataset* contains streams represented as lines, ponds represented as polygons and wells represented as points.

Geospatial dataset naming

Table 1 shows the standard file name for each dataset. Table 1 also shows a dataset title that users might commonly use to refer to the dataset and a description of the dataset. The names are designed to be unique within the entire geodata directory. They maintain their uniqueness even if the category or directory names are eliminated from the structure. The standard file names convey as much information as possible and reflect encoding into the name of

— dataset theme
— type of map features in the dataset
— spatial location or extent of the dataset

As a result, the dataset name contains
— a short version or acronym used to represent the business name of the dataset
— feature type designation p-point, l-line, a-area, t-text, g-grid, r-raster, e-enhanced Digital Raster Graphs (DRG), s-Multi-resolution Seamless Image Database (MrSID®), d-database/excel, i-index
— location or extent information such as a Federal Information Processing Standard (FIPS) code or State Soil Survey Area ID (STSSAID) number

Standard characters

Because producers and consumers of geospatial data use computers with different operating systems, (e.g., NT, UNIX) several restrictions must be imposed on naming files

to ensure all systems can access the data. The application software often places other restrictions.

Special characters
In an effort to design a list of allowable characters both computer platform and GIS software filename restrictions must be considered. In terms of operating systems, NT does not allow the characters '\ / : * ? < >" in file names. Use of a "." can be problematic in NT as it indicates a file suffix.

UNIX allows any character but some of the characters in the preceding NT list can be problematic. In addition using spaces in names or beginning a name with "-" is problematic for UNIX. Beginning a name with "." in UNIX indicates a hidden file and requires additional switches to the command that produces a directory listing.

The GIS currently in operation at the BPR sites allows dashes "-" and underscores "_" but not periods ".". The full function GIS requires that a coverage name begins with a letter.

Case sensitivity
Use of upper and lower case characters in names is common and very useful in UNIX. However, this can be problematic with NT because it does not distinguish between a file named for instance "FileName" and "filename". On UNIX, the full function GIS converts all names to lowercase. The desktop GIS converts all characters to lower case for a new shapefile name.

Allowable standard characters
The allowable standard characters identified in this standard are based on the least common denominator for both operating systems and software. This approach will not impede any potential migration of *geospatial datasets* to a new platform or new software environment as technology and software enhancements are realized in the future.

Because of the combination of all these restrictions the **only** characters allowed in a standard file name are the following:
— lower case a-z
— the numerals 0-9
— the underscore "_" character
In addition, the first character shall be a letter a-z.

These restrictions also shall apply to *geospatial category* or directory naming. These standards are very restrictive and shall not change unless the GIS platform changes with further definition from the Common Computing Environment (CCE) Team.

Name length
The total length of the dataset filename shall not exceed 30 characters. This limit has been identified during Compact Disc Read Only Memory (CD-ROM) production at National Cartography and Geospatial Center (NCGC). The only CD-ROM writing format that is universally readable throughout Natural Resources Conservation Service (NRCS) is the

International Standards Organization (ISO) 9660, Level 2, Mode 1 format. Exceeding this 30-character maximum for filenames becomes a problem when datasets are sent via CD-ROM to multiple computer platforms.

However, no attempt is made to adhere to the so-called 8.3 format required by older DOS operating systems (maximum of eight character name with a maximum of a three character suffix). This will cause problems for Microsoft Access 97® and Access 2000® because they can not import or link to .dbf files (such as those in a shapefile set) whose names are longer than 8.3 until they are renamed with an 8.3 compliant name. (Note: Access requires 8.3 for imported and exported dbf files even though it will handle the longer names.)

There is a 13 character maximum for coverages in the ARC/INFO® GIS. This was exceeded in this standard since it is designed to organize shapefiles and would prove to be easier to use in the Service Centers because it will lessen the need for cryptic names unfamiliar to many Service Center users. However, conversion of data either to or from coverages will require different names and additional processing.

Area of interest

As mentioned previously the spatial location or extent is encoded into the name. In the current scheme most maps will be clipped or tiled to the county boundary for delivery and use unless the map is a state or national coverage. This clipped extent shall be appended to the theme name and feature type as a FIPS code or STSSAID number (e.g., roads_l_**06048**.shp).

Tiling of digital geospatial data significantly impacts overall data management and system performance. In general, it is preferred that tiling is seamless, or transparent, to the user.

Clipping map extents at the county boundary is not optimal for users if they for instance wish to look at a farm or an area that crosses a county boundary. Users would prefer to be able to zoom to some arbitrary area of interest and remain unaware of the underlying database structure or tiling scheme. However, this is not possible given the current state of technology.

As a result, clipping the map data to the county boundary is the best available option for delivery and maintenance of map data. This standard's encoded file naming scheme and directory structure ensures that maps of like datasets in adjacent counties will appear next to each other in a pick list to facilitate user selection of maps.

In some cases, such as Digital Raster Graphs (DRG) and Digital Ortho Quadrangles (DOQ), an image catalog serves as an index map to 7.5-minute quad tiles for a county. This index is used to display images and conceals the underlying tiling scheme and image filenames from the user.

Local data

Any GIS data that is acquired or developed locally at the Service Center shall be placed in the geodata directory along with its completed metadata. A few guidelines are offered to assist in the incorporation of this data in a logical and consistent manner.

Existing "geospatial dataset category"

If the data corresponds to one of the existing categories or directories, the map and metadata should be placed in that directory so that it appears adjacent to any nationally provided data when the user is selecting from a pick list.

There are several circumstances where various types of local Service Center data should be incorporated into the existing "geospatial dataset category" structure. They are

— **When there is no national data and only locally developed data**, such as in the case of Wetland Reserve Program (WRP) easements data. These maps along with the Metadata should be placed in the environmental_easements directory or other relevant "geospatial dataset category" directories.

— **When there are more accurate data from local sources** the locally acquired data should be placed in the appropriate "geospatial dataset category" directories. For instance, there is locally obtained road data that are known to be more accurate than the nationally provided data named roads_l_<stnnn>. The locally acquired data and its metadata should be placed in the transportation directory and uniquely named according to the standard. One approach is to encode the datasets scale into the filename. For instance, roads12k_l_<stnnn>, indicates that the road map is locally acquired 1:12,000 scale data.

— **When data are created locally as the result of analysis** it should be placed under the appropriate "geospatial dataset category" directory if the data would be useful to others at a Service Center. The data should be named according to the standard and placed in the appropriate geodata directory. Otherwise, the results should be left on a personal disk drive where it is probably inaccessible to others.

"Local_geodata" catchall directory

When the *geospatial dataset category* of the locally acquired data does not fit in any of the existing categories, the data should be placed in the catchall directory named "local_geodata" in the "geodata" directory.

<disk drive>:

```
📁 geodata
  📁      <geospatial dataset category (directory/folder)>
  📁  transportation <geospatial dataset category (directory/folder)>
      📄    roads12k_l_<nnnnn> <geospatial dataset>
      📄    <geospatial dataset>
  📁  local_geodata <geospatial dataset category (directory/folder)>
      📄    roads12k_l_<nnnnn> <geospatial dataset>
      📄    <geospatial dataset>
```
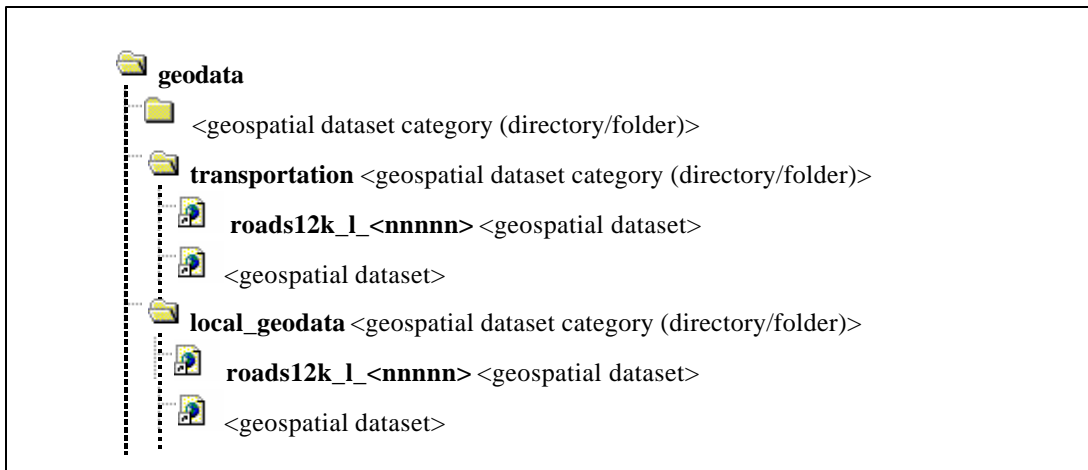
Figure 3— Geospatial data structure with sub-directory "local_geodata"

Local data naming

Any locally acquired data should be named in accordance with this standard and only lower case a-z, 0-9 and "_" characters used in names as described in 0. Also, the theme, feature type and spatial location or extent should be encoded into the name as described in 0. Additionally, the name must not exceed 30 characters as described in Clause 0.

Geospatial data directory structure: "geodata"

This section and table describes map layers common to all BPR sites and Service Centers.

Overview

The physical implementation of directories and file names supports the USDA Service Center Modernization Strategy to develop a basic nationally consistent set of core geospatial data that will provide a foundation on which to base business applications.

Table notations

Table 1 identifies the specific categories and geospatial files within each category and the standard naming conventions for the file. The table applies the naming guidelines set forth in 5.1 of this standard where each file name encodes: the dataset theme, feature type, and location for which the dataset applies.

The following notations apply to the file naming conventions used in Table 1:
  — **< >** indicates a substitution notation
  — **( )** indicates a choice list notation
  — **|** indicates a choice of options and reads as "or"
  — **<mmm>** is the three-letter abbreviation for the applicable month (e.g., precip<mmm>_a_<st>, precipjun_a_co is the file name for Colorado June precipitation)
  — **<nnn>** is the congress number
  — **<stnnn>** is the 2-character state postal abbreviation and 3-digit County FIPS codes (e.g., drg_r_<mdnnn>, drg_s_md047 is the file name for Worcester County, Maryland DRG)

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— **\<a\>** is a substitution for the leading character that describes the Mosaicked Digital Ortho Quadrangles (MDOQ) imagery
— indicates DOQQs (Digitial Ortho Quarter Quadrangles) are present and reside in native Universal Transverse Mercator (UTM) zone
— x indicates there is a missing DOQQ in the DOQ
— z represents re-projected Digital Ortho Quadrangle (DOQ) into dominant county UTM zone
— **\<nnnnnnn\>** is a 2-digit latitude number, 3-digit longitude number, and 2-digit quadrangle number (e.g., \<a\>\<nnnnnnn\>, m3010601 is a Tagged Image Format (TIF) DOQ for the native UTM zone and 30 north latitude 106 west longitude, sheet 1 of 64)
— **\<st\>** is the two character state postal abbreviation (e.g., precip_a_\<st\>; precip_a_co is the filename for Colorado annual precipitation)
— **\<stssaid\>** is the state soil survey area ID (e.g., soils_l_\<stssaid\>; soils_l_24047 is the filename for Worcester County, Maryland Soil Survey Geographic Database (SSURGO) Lines)
— **\<usgs standard\>** is the standard naming convention used by the United States Geological Survey (USGS)
— **\<x-x\>** is number - total tiles in a county Ortho mosaic. Tiles are numbered west to east and north to south. These are county subsets due to maximum file sizes;
— **\<none\>** is no file name yet assigned because data has never yet been delivered
— **\<County Name\>** is the actual name of the county for the dataset title
— **us** indicates a dataset covering United States
— **p, l, a,** or **t** indicate the dataset feature types of point, line, area, or text in a shapefile set (.shp .dbf .shx .sbn .sbx .prj)
— **g** indicates a grid dataset feature type
— **r** indicates a raster dataset feature type
— **s** indicates a MrSID compression raster dataset feature type
— **e** indicates enhanced DRG with map collar removed
— **i** indicates an image catalog dataset feature type (.dbf);
— **d** indicates a database/excel spreadsheet dataset feature type

Tab1e 1—Geospatial data "geodata" directory structure and naming conventions

Directory	File name	Dataset title	Description
air_quality	<none>	Air Quality <County Name>	No files delivered to date
cadastral	ntlparks_a_<stnnn>	National Park Areas <County Name>	National Park Polygon data
	ntlparks_l_<stnnn>	National Park Boundaries <County Name>	National Park Line boundaries for cartographic display
	plss_a_<stnnn>	Public Land Survey System <County Name>	Public Land Survey System polygon data
	plss_l_<stnnn>	Township Range Section <County Name>	Public Land Survey System boundaries for cartographic display. No files delivered to date
census			(Demographics) Defined Later – Identify options to procure data
climate\precipitation	precip_a_<st>	Annual Precipitation Range < State>	'precipitation' is a subdirectory of 'climate'. Annual precipitation (sum of 12 monthly maps) for the entire state. <st> is equal to the state two character postal abbreviation
	precip_l_<st>	Annual Precipitation Isolines <State>	Annual precipitation boundaries for cartographic display for the entire state. No files delivered to date
	precip<mmm>_a_<st>	<mmm> Precipitation Range <State>	Mean (1961-1990) Monthly precipitation data for the entire state. <mmm> is equal to the three-letter abbreviation for the applicable month
	precip<mmm>_l_<st>	<mmm> Precipitation Isolines <State>	No files delivered to date
	precipann_r_<st>	Mean annual precip. raster for <State>	Mean annual precipitation for a given state; ascii raster
	precipann_l_<st>	Mean annual precip., A RC polygon (vector) for <state>	Mean annual precipitation for a given state; ARC polygon (contour)

Directory	*File name*	*Dataset title*	*Description*
climate\temperature	<none>		'temperature ' is a subdirectory of 'climate'. No files delivered for Service Center to date.
common_land_unit	clu_a_<stnnn>	CLU <County Name>	Common Land Unit (CLU) – Farm field boundary
	dlu_a_<stnnn>	DLU <County Name>	District Land Unit (DLU) – Farm field boundary
conservation_practices	<none>	Planned and Applied Conservation Practices	Conservation practice data aggregated for the Service Center. Toolkit group will resolve naming. No files delivered to date. Data is developed locally
cultural_resources	<none>	Cultural Resources <County Name>	Archeology, state historic sites, Native American settlements and burial grounds, National Park Service National Register of Historic Places, National Historic Landmarks and National Natural Landmarks. No files delivered to date
elevation	contour_l_<stnnn>	Contour Lines <County Name>	1:24,000 USGS hypsography line data
	ngs_p_<stnnn>	Geodetic Survey Monuments <County Name>	Location and description of National Geodetic Survey Monuments (point data)
	<usgs standard - native format>	<Full Quad Name>	1:24,000 USGS Digital Elevation Model (DEM). Name is the same as the USGS drg standard name, except the leading character is a "d"
endangered_habitat	<none>		No files delivered to date.
environmental_easements	wrp_a_st	Wetland Reserve Program <State Name>	Aggregation of WRP easements for State Service Centers. No files delivered to date. Data developed locally
	wrp_a_stnnn	Wetland Reserve Program <County Name>	Aggregation of WRP easements for a specific Service Center area. No files delivered to date. Data developed locally
government_units	boundary_l_<stnnn>	Administrative Boundaries <County Name>	1:24,000 USGS boundary line data

Directory	File name	Dataset title	Description
	boundary_a_<stnnn>	Administrative Areas <County Name>	1:24,000 USGS boundary polygon data (state park, wildlife refuge, etc.)
	congdist_<nnn>_a_us	Congressional District <nnn>	Full US Congressional districts 104 – 106. <nnn> is the congress number
	cities_p_<stnnn>	Cities <County Name>	Cities point data from Geographic Names Information System (GNIS) populated places file
	cnty_a_<stnnn>	County Boundary <County Name>	1:24,000 county boundary polygon data
	cnty_l_<stnnn>	County Line <County Name>	1:24,000 county boundaries for cartographic display
	manfetr_a_<stnnn>	Man Made Area Features <County Name>	1:24,000 USGS manmade feature polygon
	manfetr_l_<stnnn>	Man Made Line Features <County Name>	1:24,000 USGS manmade feature line data
	rcd_a_us	Resource Conservation & Development Areas	Full US Resource Conservation & Development Areas polygon data
	state_a_us	State Areas	Full US state polygons
	state_l_us	State Boundaries	Full US state boundaries for cartographic display
	swcd _a_us	Soil and Water Conservation District	Full US Soil and Water Conservation District polygon data
	zip_p_us	Zip Codes	Full US zip code centroids (points). GIS Implementation Team to identify data source
hydrography	damsites_p_<stnnn>	National Inventory of Dams <County Name>	National Inventory of Dams point data
	femaq3_a_<stnnn>	Flood Hazard Maps (FEMA) <County Name>	Federal Emergency Management Agency (FEMA) polygon data
	hydro_dmf_l_<stnnn>	Rivers and Streams (DMF) <County Name>	1:24,000 Soil Survey Digital Map Finishing (DMF) line data
	hydro_l_<stnnn>	Rivers and Streams <County Name>	1:24,000 USGS line data
	hydro_t_<stnnn>	River and Streams Annotation <County Name>	Labels for 1:24,000 USGS rivers and streams

Directory	File name	Dataset title	Description
	hydro_rf_l_<stnnn>	Rivers and Streams (EPA Reach 3) <County Name>	1:100,000 Environmental Protection Agency (EPA) Reach File line data
hydrologic_units	huc14_a_<stnnn>	14 Digit Hydrologic Units <County Name>	Polygon data of the 14 digit Hydrologic Units
imagery	<none>		Other imagery files such as satellite or non-standard imagery. No files delivered to date
land_use_land_cover	lulc_a_<stnnn>	Land Use Land Cover <County Name>	Polygon data of the Land Use Land Cover
	nonveg_a_<stnnn>	Barren Land (Topo Map) <County Name>	1:24,000 USGS non-vegetative polygon data (sand area, beach, gravel beach, etc.)
	surfcvr_a_<stnnn>	Surface Cover (Topo Map) <County Name>	1:24,000 USGS surface cover polygon data (woods, brush, orchard, etc.)
map_indexes	napp_p_<stnnn>	Photo Index (NAPP) <County Name>	National Aerial Photography Program (NAPP) point data
	quads12k_a_<stnnn>	Quarterquad Areas <County Name>	1:12,000 quad polygon data
	quads12k_l_<stnnn>	Quarterquad Lines <County Name>	1:12,000 quad boundaries for cartographic display. No files delivered to date
	quads24k_a_<stnnn>	Quadrangle Areas <County Name>	1:24,000 quad polygons
	quads24k_l_<stnnn>	Quadrangle Lines <County Name>	1:24,000 quad boundaries for cartographic display. No files delivered to date
ortho_imagery	mosaic<x-x>_s_<stnnn>	County ortho <County Name>	MrSID county ortho mosaic <x-x> number-total tiles
	ortho_i_<stnnn>	Ortho Image Catalog <County Name>	Ortho image catalog in DbaseIV format for TIF DOQs

Directory	File name	Dataset title	Description
	<a><nnnnnnn>	MDOQ <Full Quad Name>	TIF DOQ <a><nnnnnnn> is leading character, two spaces for latitude, three spaces for longitude and two spaces for the 01 to 64 quadrangle numbers in the one degree block. Leading character can equal: m – all DOQQs present and reside in native UTM zone x – there is a missing DOQQ in the DOQ z – re-projected DOQ into dominant county UTM zone
	<usgs standard>	DOQQ <Quarterquad Name>	USGS Quarterquads – Any format
	mosaic_tmp_<x-x>_s_<stnnn>	County ortho <County Name>	Unenhanced, temporary MrSID county ortho mosaic <x-x> number-total tiles
plants	<none>		No files delivered to date
soils	crpdata_d_<stssaid>	1990 CRP Frozen Soil List	NOT A MAP-Excel spreadsheet with 1990 frozen soils data used for Conservation Reserve Program (CRP) eligibility determinations
	soilattributes_d_<stssaid>	<Soil Survey Area Name> Soil Attributes	NOT A MAP-Access data base of National Soil Information System (NASIS) distribution format 1.0
	mlra_a_us	Major Land Resource Areas	Full US Polygon data of Major Land Resource Areas (MLRA) Reselected to SC Area
	soil_a_<stssaid>	SSURGO Areas <Survey Area Name>	SSURGO Soils Polygon data
	soil_l_<stssaid>	SSURGO Lines <Survey Area Name>	Outlines of the SSURGO polygon boundaries for cartographic display
	soil_p_<stssaid>	SSURGO Points <Survey Area Name>	Point data of the soils special features
	soillfetr_l_<stssaid>	SSURGO Linear Features <Survey Area Name>	Line data of the soils special features
	ssa_a_<stssaid>	SSA Boundary <Soil Survey Name>	Polygon data limit of Soil Survey Area (SSA)

Directory	File name	Dataset title	Description
topographic_images	drg_i_<stnnn>	Topo Image Catalog <County Name>	TIF Digital Raster Graph index of enhanced DRG
	drg_s_<stnnn>	Topo <County Name>	MrSID Digital Raster Graphs without map collar
	<usgs standard>	<Full Quad Name> - Topo	USGS DRG Quad with collar
	<usgs standard>_e	<Full Quad Name> - Enhanced Topo	Enhanced DRG image with map collar removed
transportation	misctrans_l_<stnnn>	Utility lines (Topo Map) <County Name>	1:24,000 USGS line data (power transmission lines, substation, pipelines, etc.)
	railroads_l_<stnnn>	Railroads (Topo Map) <County Name>	1:24,000 USGS line data-railroad layer
	railroads_dmf_l_<stnnn>	Railroads (DMF) <County Name>	1:24,000 Soil Survey (Digital Map Finishing) railroad line data
	roads_l_<stnnn>	Roads (Topo Map) <County Name>	1:24,000 USGS line data-Roads layer
	roads_dmf_l_<stnnn>	Roads (DMF) <County Name>	1:24,000 Soil Survey (Digital Map Finishing) roads line data
wetlands	nwi_a_<stnnn>	NWI (FWS) <County Name>	Polygon data of the National Wetland Inventory (NWI) Fish and Wildlife Service (FWS)
	nwilfetr_l_<stnnn>	NWI Linear Features (FWS) <County Name>	Linear Features line data of the NWI
	nwi_l_<stnnn>	NWI Lines (FWS) <County Name>	Outlines of the NWI polygon data for cartographic display
	nwi_p_<stnnn>	NWI Points (FWS) <County Name>	Point data of the NW I

Appendix A − Bibliography

When the following standards are superseded by an approved revision, the revision shall apply.

[A1]   Geospatial Data Acquisition, Integration, and Delivery National Implementation Strategy Plan, Draft #4 Service Center Business Process Reengineering Data AID Team, September 22, 1999

[A2]   SCI Std 003, Standard for Geospatial Data Set Metadata

[A3]   SCI Std 005, Standard for Geospatial Feature Metadata [This standard is currently under development.]

[A4]   SCI Std 007, Standard for Geospatial Data

[A5]   USDA Service Center Geographic Information System (GIS) Strategy, Interagency Team, August 18, 1998

[A6]   USDA Service Center Initiative Directory Structure and File Naming Convention Change Control Policy, Initial Draft, IO Lab, October 8, 1999

Appendix B − Business Process Reengineering directory structure

Prior to the development of this standard, the initial directory structures (referred to as version 5) for the *geospatial dataset collection* fielded at the Business Process Reengineering (BPR) sites reflected the storage structure at the data warehouse that supplied the data. In order to maintain all county based geospatial datasets in a single warehouse separated according to Service Center, the directory structure was defined as:

<disk drive>:
    Service Center Themes
        OIP number and Service Center Name
            State and County FIPS with County Name
                <geospatial dataset category (directory/folder)
                <geospatial dataset category (directory/folder)
                <geospatial dataset>
                <geospatial dataset>
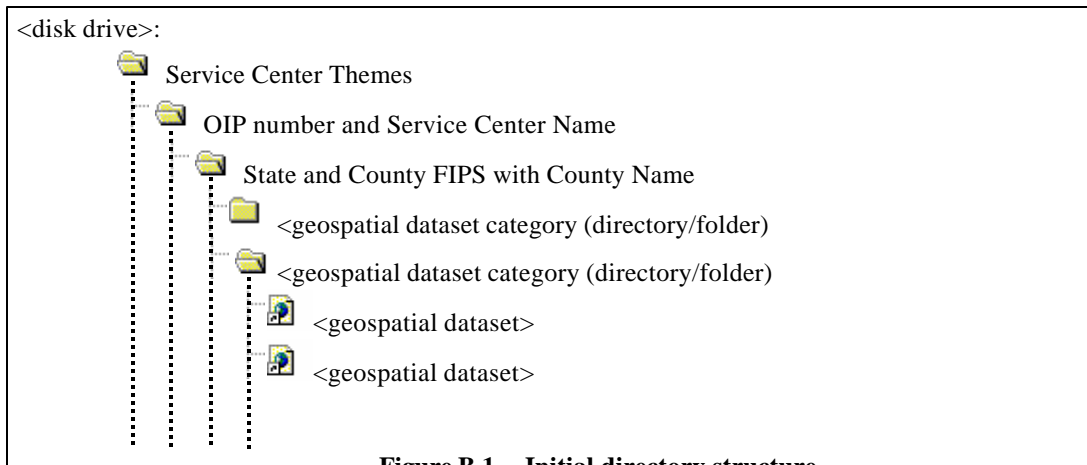
Figure B.1 – Initial directory structure

This structure organizes datasets within a generic Service Center Themes folder according to a unique Service Center Office Information Profile (OIP) number and second according to county. Each county serviced within a Service Center possesses its own uniquely identified folder (directory) and is named according to the five-digit Federal Information Processing Standard (FIPS) code and county name. For instance, the actual path to a roads map on NT would be:

C:\Service Center Themes\2487 Sacramento\06067 Sacramento\Transportation\roads.shp

Personnel at the BPR sites using the desktop GIS, ArcView® in its native mode to access geospatial datasets, found the length and depth of this directory structure too cumbersome for accessing geospatial datasets. For example, Service Centers that service only one county still had to navigate through the county level directory (<State and County FIPS with County Name>) to access dataset categories where only one county's worth of data existed. Similarly, the Service Center level of the directory structure (<OIP Number and Service Center Name>) had to be negotiated even though there would only ever be one occurrence at this level. As a result of this learning experience at the BPR pilot sites and experiences developing applications that have to traverse this directory structure, the directory structure was flattened and streamlined to facilitate access to the datasets with fewer steps.

G. GIS Folders Structure & File Names

Below is an example of Nebraska's file system. This may serve as a template for the way your particular state organizes its files. Note: to create the place the data on the DRIVE with the most memory.   Otherwise there could be some complications with ArcView due to the amount of space it will need to run effectively.

📁 (F:)
- 📁 geodata
  - 📁 cadastral
    - plss_a_ne109.shp
    - plss_a_ne109.shx
    - plss_a_ne109.dbf
  - 📁 common_land_unit
    - clu_a_ne109.shp
    - clu_a_ne109.shx
    - clu_a_ne109.dbf
    - crp_t_ne109.dbf
    - wet_p_ne109.dbf
    - wet_p_ne109.shp
    - wet_p_ne109.shx
  - 📁 compliance
    - comp_a_31109.shp
    - comp_a_31109.shx
    - comp_a_31109.dbf
    - comp_t_31109.dbf
    - NE109_578.txt
    - NE109_afis.txt
  - 📁 imagery
    - <slide imagery here>
  - 📁 layouts
    - 📁 Plss Layouts
      - 1-11-16.apr
      - 2-11-16.apr
    - 📁 CLU Layouts
  - 📁 ortho_imagery
    - mosaic1-1_s_ne109.sid (Mr. SID Image)
    - mosaic1-1_s_ne109.sdw
    - mosaic1-1_s_ne109.txt
    - ortho_i_ne109.dbf (image catalog)
    - mxxxxxxx.tif (image tiles) *
    - mxxxxxxx.tfw
  - 📁 soils
    - soil_a_31109.shp (SSURGO soils polygon data)
    - soil_a_31109.shx
    - soil_a_31109.dbf
    - soil_a_31109.sbn
    - soil_a_31109.sbx
  - 📁 working
    - cluproj.apr

- 📁 gis_documents
- 📁 temp
  - template.def (do not delete this file)

H. GIS Contacts

Contact your State Coordinator
A State Coordinator exists for every state. Names and contact information are available at http://dc.ffasintranet.usda.gov/fsagis.html

Specify who will be in charge of GIS locally
Select someone who will be the GIS technician for the Digitizing Sites.

Hardware contact
The following hardware is required to run the CLU Digitizing Tool:
➢ Computer: Pentium or higher Intel-based microprocessor with a hard disk
➢ Available hard disk space: 3.17 MB
➢ RAM: 24 MB RAM (32 MB recommended); 17 MB Virtual memory
➢ Operating System: Microsoft Windows NT 4.0 or higher
➢ Display or Monitor: VGA or better resolution monitor
➢ Pointing Device: Microsoft compatible mouse
➢ Digitizer: Optional

Contact State GIS Coordinator
Kansas City Help Desk
Contact Beltsville, Maryland USDA Hardware Support
http://www.sci.usda.gov/cce/people.html

Software contact
The following software is required to run the CLU Digitizing Tool:
➢ ESRI ArcView GIS 3.1 or higher for Windows
➢ MS Word or other word processor

Contact Jim Heald 202-720-0787

Training contact
FSA/ VERIDIAN MRJ will supply training on ArcView and CLU Digitizing & Maintenance. Contact Jim Heald or Jessica King to schedule training in your state.

FSA Policy and Procedures contact
Contact Carol Ernst for any question concerning policy and procedures.
Carol.Ernst@usda.gov

Software Problems contact
With suggestions and bug problems, contact John Wileman at 703-435-9359 or Neal Moran at 703-435-9541. John.Wileman@veridian.com or Neal.Moran@veridian.com

USDA LINKS

http://www.fsa.usda.gov/edso/   FSA office information for each state
http://www.sci.usda.gov/cce/   CCE site
http://ds.usda.gov/   USDA Directory Server
http://www.fsa.usda.gov   Official USDA FSA Web Site
http://www.sci.usda.gov/sci/default.htm   USDA Service Center
http://dc.ffasintranet.usda.gov/fsagis/   FSA GIS Intranet
http://intranet.fsa.usda.gov/fsa/   FSA Intranet

I. Using WinZip

The WinZip program compresses files to a fraction of their normal size. This is important when sending files via email. If files are too large they can not be sent through email.

Some files compress to one-tenth of their original size and others, such as images, hardly compress at all. GIS shapefiles compress to about half their original size. WinZip is also convenient because it can zip several files together into a single file, making them easier to send by email.

Creating a zipped file if there is a single file
1. In Windows Explorer, **click** the file to be zipped.
2. **Right-click** on the file and select "add to xyz.zip" where "xyz" is the name of the file.

3. The newly zipped file will then appear in the same folder.
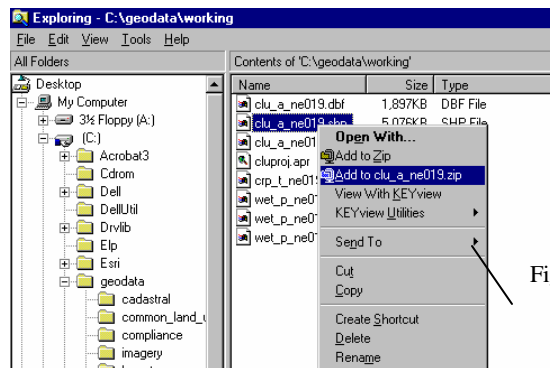
Figure 1.1

Creating a zipped file consisting of multiple files
1. In Windows Explorer, **click** to **select the files to be added**. Hold the shift or ctrl key to select multiple files.
2. **Right-click** on the selected files and choose "**add to Zip**".
3. The "Add" window will pop up. Before pressing any keys, **click** in the "Add to Archive" view to place the insertion point at the end of the path.

4. **Enter a name** for the file to be zipped such as "lancasterclu".

5. **Click** "**Add**"
6. A progress bar will appear in the WinZip window and the file "Lancasterclu" is created. Close out the WinZip window.
7. "Lancasterclu.zip" should appear in the current folder in Explorer.

Unzipping a zipped file

1. In Explorer, **double-click** on the zip file. A zipped file is always listed as type "WinZip File" and has the winzip icon (Figure A).

 Figure A

2. In the WinZip window, which pops up, **click** on the "**Extract**" button.
3. In the Extract window, navigate to the folder where the file is to be extracted or accept the default folder. This is where the zipped file is located.
4. **Click Extract** and the zipped files will decompress.
5. Close the Winzip window.

J. Creating CDs

Writable CDs

The Hi-End GIS workstations come equipped with internal CD-Writers, which can make several different kinds of CDs. A CD can store around 400 times as much data as a floppy. The CD-Writer will be used on a daily basis for backup. It will also be used for transferring data, such as shapefiles, that are sometimes too large for email. CDs are inexpensive compared to other storage media.

There are two types of CDs:

CD-R – "R" is for "Recordable". CD-R's can be recorded only once and are somewhat cheaper than the other type. They usually come on a spindle of 50.
Uses – Permanent data storage. Providing data to outside agencies.

CD-RW – "RW" is for "Re-Writable". CD-RW's can be recorded, erased and rerecorded >1000 times. They often come packaged in a protective jewel box (plastic case).
Uses – Rotational backups, temporary data, and archiving files, which could be updated.

There are also various ways of formatting CDs. The two types of CD formatting of concern to us are:

EasyCD – EasyCD Creator is software used to create a standard data CD that can be read in almost any computer CD-ROM drive. The EasyCD Creator must be started each time you want to copy files to CD. It takes two or three minutes for the CD-Writer to write a CD using Easy CD Creator.
Advantages – The CD is readable in almost any computer.
Disadvantages – It is a more lengthy and complicated process.
Uses – Creating CDs that will be used with workstations not equipped with a CD-writer. Creating CDs for external entities.

DirectCD – In order for a CD to function as a DirectCD it must be specially pre-formatted. It takes about 30 minutes to format a DirectCD on a new high-end GIS workstation. Once a CD has been formatted it does not need to be done again. A special program is not required to write to a DirectCD. Files may be conveniently written and deleted by drag and drop within Windows Explorer. It usually takes no more than a few seconds for writing to be completed. Not all CD-ROM players are equipped to read this type of CD.
Advantages – Quick and easy.
Disadvantages – Must be pre-formatted and not universally compatible.
Uses – Rotational backup CDs and exchanging CDs between FSA GIS sites.

Creating (writing to) a CD using EasyCD Creator

1. **Double-click** the "Create CD" icon on the desktop.
2. **Click** the "Data" option.
3. **Click "Data CD".**
4. The EasyCD Creator window appears. The upper half (Explorer) shows the contents of the workstation. The lower half of the window shows the files that are to be added to the CD. Navigate in the upper half of the screen to the files that are to be added and right-click/copy or simply drag them.
5. **Right-click/paste or drag** the file(s) to the lower-right window.
6. When finished adding files click the "**Create CD**" button on the toolbar.
7. **Click "ok"** at the "**CD creation setup**".
8. The system test will run for a minute or two.
9. **Click "ok"** when the window announces "**CD created successfully**".
10. Close out the window and do not save the layout. The CD can then be ejected.

Note: If you want to write additional data to a previously written CD, the previous session must be imported. In EasyCD Creator go to *CD -> Import Session* and then start adding new files to the old ones.

Converting a standard, blank CD to DirectCD format

1. **Double-click** the **"Create CD"** icon on the desktop.
2. **Click** the **"Data"** option.
3. **Click** the **"Direct CD"** button.
4. **Click "Next"** in the next three boxes that pop up and then **"Finish".**
5. **Click "OK"** to begin formatting. It takes 27 minutes to format a DirectCD, but once it has been formatted it does not need to be done again.

Creating (writing to) a DirectCD formatted CD

1. Simply drag and drop or cut and paste within Windows Explorer. The N: Drive is the CD-writer in the current configuration.

K. Digitizing Centers FAQ

Digitizing Center Support --
Frequently Asked Questions

This page contains answers to common questions handled by our support staff, along with some tips and tricks that we have found useful and presented here as questions.
Note: In these answers we will follow a few shorthand conventions for describing user-interface procedures. Key combinations will be presented like this: Ctrl+Alt+Delete, which means that you should press and hold down the Control key, the Alt key, and the Delete key at the same time. Menu selections will be presented like this: File->Open, which means that you should open the File menu, and then make the Open selection.

What is ArcView and what can it do?

ArcView **GIS** is a desktop geographic information system. With ArcView GIS you can create intelligent, dynamic maps using data from virtually any source and across most popular computing platforms. ArcView GIS provides the tools to let you work with maps, database tables, charts, and graphics all at once. You can also use multimedia links to add pictures, sound, and video to your maps.

Labels or Attributes - what should I use?

There seems to be some confusion out there about labels and attributes. Labels are text on your map display that allows you to view the data associated with a set of fields such as tract, farm or field number and acreage. They are for display and map printing only. In ArcView, labels are bound to the ArcView project, not to the data file. Do not spend large amounts of time sizing and placing labels. It is unnecessary to use labels, EXCEPT for displaying information on the screen and printing maps for customers.
Attributes, on the other hand, are stored with the data in the database. Without attribute data, ArcView cannot display labels (unless you manually enter Text on the display, WHICH YOU SHOULD NEVER DO). Use the buttons on the CLU toolbar for entering and updating attribute data.

How do I merge two or more shape files together?

The simplest way is to use the Geoprocessing Extension and then use the Merge Option. Select two or more themes from the list and an output file name. However, the themes must have different names...

Are you having trouble with adjacent polygons not staying in your shape file? We draw the adj. polygon and double click for the end and it won't create the new polygon.

You have to be very sure that you start and finish the adjacent polygon well inside the existing polygon or it will not be created.

Can the thin gray line that ArcView displays when you are drawing a new polygon be changed?

We are looking into it, but probably not.

How do we get the units to display in Feet on the Status bar? This will allow us to digitize a line that is; for example 100 feet from the current fence line.

Users can go into View -> Properties and set the distance units to feet. This gives you a readout on the status line of the length in feet of the current segment when digitizing. You aren't going to get survey accuracy out of this.

QC Overlapping Polygon Tool

While you are going through the list of overlapping polygons you need to delete the graphics. You may also delete the graphics immediately afterwards. While going through the list, simply hit the delete graphic button. After finishing with the tool, go to Edit -> Select All Graphics -> Delete Graphics. These menu items will be grayed out if you are still in edit mode. Save your changes and then delete the graphics. If you do not delete the graphics, the tool may function erratically.

Correcting Overlaps

2) Subtracting features to correct overlaps. If the boundary of one of the polygons is the correct boundary line for both polygons you can use Subtract features to correct it. You can only use subtract features if **TWO** polygons are selected. The line used to cut the polygons depends on which feature is on top.
Get in Edit mode. Select the two polygons if they are not already selected. Choose Edit -> Subtract Features. If the wrong boundary was chosen, go to Edit -> Undo Feature Edit. Then hold down the shift key and choose Edit -> Subtract Features.

Using Clean Polygon Menu Option

This is a little more powerful than I originally thought (and consequently a little more dangerous). Depending on how you set your General Snapping tolerance this can do wonderful or horrible things to your data. It will correct overlaps and gaps between your polygons if they are within the general snapping tolerance. It will also collapse polygons if you have your general snapping tolerance set too high.

Checking your Snapping tolerance

Make sure that your CLU file is the active theme. Go to Theme -> Properties -> Editing. You will see options for General and Interactive Snapping. If the box is checked then snapping is ON. The boxes to the right will show the size of the snapping tolerance and the Units (this should be feet but may be meters). You can change either tolerance by typing a new number in the box. If you set General Snapping to more than 5 feet you may have problems. Interactive Snapping can be set higher.

Using Snapping to correct overlaps.

For using the Vertex command to correct overlaps, set general snapping (usually no more than 5 feet). Move the vertices of the polygon that is overlapping. If you move the vertices within the snapping tolerance they should snap to the other line. Continue until the overlap is gone. Sometimes fixing an overlap is as simple as deleting a single vertex in the bad line.

Interactive Snapping

Interactive snapping is used when digitizing new polygons, using the split tool, and using the adjacent polygon tool. It allows you to snap your next vertex to a boundary line, an existing vertex, or an existing intersection. The interactive snapping tolerance can be set fairly large because it only affects the line you are working with. While you are drawing the line use the right mouse button to bring up the edit popup menu and select the snapping option that you want to use. Then place your vertex within the tolerance of the feature you are trying to snap to.

Advanced Snapping

You can use snapping to match the boundary of one CLU file to an adjacent CLU file (adjacent flight paths, adjacent townships, etc). Add the Adjacent CLU file to your view as a theme. Set general and interactive snapping tolerances for this theme. Snap features in your current edit shape file to the "Snap" shapefile, by creating new polygons along the boundary or moving vertices along the boundary.

L. Nebraska's Digitizing Standards

This is an example of how the state of Nebraska has created digitizing standards. Also the Digitizing Standards can be found outlined in the **8CM**.

USDA

Nebraska Digitizing Standards

(Reference for digitizing CLU's)

Primary standards

- Delineate the lines on the source document to the Aerial DOQ (Digital Orthophoto Quad) County as accurately as possible. The Digitizer delineates all lines indicated on Source document.

- Farm, tract and field is identified in the FSA CLU Attribute Data Entry Dialog Box, as shown in Figure 1, which also includes the Land Attribute Code and the Common Standardized Comments [Table 1 (page 3)] in the comment text box. The Land Erosion Status [Table 2 (page 5)] in the *HEL Status* section indicates the soil type for the CLU. *Program Acres* is the acres identified on source document.

Figure 1.

Other considerations

- Farmsteads located within another designated land area (as indicated by source document) are attributed with the code of the predominating CLU.

- Public roads and urban areas are the only areas not digitized.

- Railroad tracks are included in the polygon but separated from other CLUs. If the railroad tracks are not delineated on the source document, additional lines to delineate railroads from farms and tracts are created by the digitizer.

- Wetlands CLUs, including artificial, linear, prior converted, farmed wetland (FW), etc, are not delineated on the LAND CLU layer but delineated on the WETLAND layer.

    - Transfer farm photocopies are examined for wetland areas. If wetland is not delineated on the county aerial photos, the wetland areas are denoted in pencil on the aerial photo for reference when generating the WETLAND layer on the DOQ.

- Non-Agricultural (NA) CLUs, except for towns and cities, are digitized inside a polygon.
Non-Agricultural CLUs are delineated by the digitizer and identified as 999 in FSN text box.

- Pivots - CLU conditions
1) If non-cropland corners in the boundaries of pivot, then delineate CLUs
2) If cropland corners in the boundaries of pivot, then do not delineate CLUs, field text box is coded with 111.

    Pivots - Soil Status conditions
1)   If HEL status is not uniform between all fields, then mark RHEL in comment text box and undetermined HEL status.
2)   If HEL status is uniformed between all fields, only use the HEL status indicated on source document.

- Reuse pitland (check line color which maybe different from standard black) should be delineated if located in a field.

Table 1. LAND ATTRIBUTE CODES

Refer to 8-CM
Identity Scheme for Missing Field or Tract Numbers
(Use for Tract/Field Numbers that will need to be corrected at the County level).
Bold print indicates comment or an example of a comment used in the comment text box

FSN	Tract	Field	Description	Comments
999			- No farm number available - Farm numbers identified by an alphabet character, i.e. A-114 (Saunders) - NA - Non Agricultural land - NC – Non-cropland if no farm or tract # is identified - Railroads - Lakes	
If 999 is not used in FSN, then				
Identification depends on source document			Farms located within the county's perimeter and that county maintains the information about the farm.	**no hel** (no identification of land erosion status) **no field #**
	999		- Multi-tract - Tracts are digitized as a whole	**no tract #** - Photo acres amount. An example: "**a 58.8**" **(COMMENT NOT VALID AFTER 12/05/2000.)**
		use lowest field #	Field stripping or terracing is used in farm production (Banner county)	**rhel** – if soil status is not uniform throughout field.
Or				
31 - - -	31 - - -		- Out of county farms (transfer farms) should be denoted with the state and county code in the Attribute table farm and tract text box. - If the transfer farm maps are not readily available, a comment should be entered in the table in the following format: " (county name) t (township #) r (range #) s (section #)". An example would be: " Seward t10 r5 s15" (should be deleted when transfer farm is completed)	"(County name) t (township #) r (range #) s (section #)". An example: "**Seward t10 r5 s15**" (should be deleted when transfer farm is completed). **no hel** (no identification of land erosion status) **no field #** **no tract #** - Photo acres amount. An example: "**a 58.8**" **(COMMENT NOT VALID AFTER 12/05/2000.)**
Depending on CLU on source document, use field codes indicated				

		111	▪ No permanent boundaries that can be seen to delineate
			▪ Difference between DOQ and Source Document
			▪ Chair-hooked fields (Par.~.2-CP)
			▪ CRPs and fields without visible boundaries
			▪ Additional lines appropriated by digitizer
			▪ Pivot that have cropland in corners that are delineated. Digitizer will delineate non-crop land from pivot CLU and identify appropriate soil status.
				▪ **rhel** – if soil status is not uniformed throughout pivot fields.
				▪ **chel** – if a farm has a field which is subdivided into multiple fields and has more than one hel status. (chairhooks may or may not be used)
				▪ **no visible boundaries**
				▪ **chair-hooked**
				▪ **crp <00-00>** (identify year) i.e. crp 98-07 or **crp** (no year identify)
				    (a) use 111 - if no permanent boundaries exist or acreage is different on Source Document (based on "rule of thumb") or the field is identified with a string character.
				    (b) use Field # - if no acres are excluded from field
				▪ **check lines**

		222	▪ Pasture or rangeland ▪ FWP – Farmed Wetland Pasture ▪ NC – Non cropland (or 888)	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"
		333	▪ Forest CLU's' as defined by 8-CM. Code not to be used for shelter belts, groves, etc. adjacent to farmsteads or other built up areas	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"
		444	▪ ***Any building with a roof*** including farmsteads, adjacent feedlot areas, shelter belts, bin sites, lanes etc. **(Digitizers use 444 code only)**	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"
		555	▪ Not used	
		666	▪ Barren land CLU's as defined by 8-CM	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"
		777	▪ Built-up CLU's as defined by 8-CM excluding farmsteads. *Counties determine which CLUs use this code.* (Digitizer use 444 code only)	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"
		888	▪ CLU's do not qualify in any other category ▪ Ponds contained within pasture CLU's, lagoons, reuse pits, or other small water bodies delineated out of cropland (even if over 2.0 acres) ▪ NC – Non cropland (or 222) ▪ AU – Agricultural use i.e. dam, trees,	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"

			etc.	
		999	▪ Water CLU's as defined by 8-CM excluding ponds contained within pasture CLU's, lagoons, reuse pits, or other small water bodies delineated out of cropland (even if over 2.0 acres).	**CODE NOT VALID AFTER 12/05/2000** Attribute entry for CLU field text box is blank or "0"

Table 2. LAND EROSION STATUS

Land Erosion Status	*Description*
HEL	▪ "yes" on the attribute table if soil is highly erodible.
NHEL	▪ "no" on the attribute table if soil is not highly erodible.
Exempt	▪ rarely used
Undetermined	▪ Unmarked fields or CLUs without HEL/NHEL status is marked as ▪ If status is not identified on Source document, the **no hel** comment is noted in Comment text box

Acre difference may be due to:
  i.   Incorrect placement of lines (either by digitizer or proprietor of the photo image).
  ii. Error of transposed amount of acres.
  iii. Previous error due to survey estimation.
  iv. Angle and distance tolerance of given image

To maintain quality control, lines on the digitized image need to be verified for accurate placement. If discrepancy exists between digitized acres and photo acres, which is determined by digitizer's "rule of thumb", the source docume nt acre amount will be noted in the comment area of the attribute box.

Reporting Bugs or Suggestions

If a user comes across a bug in the software program, the user should write down the error using the attached form (an interim method prior to the future initiating of an online problem reporting system) and send it to Jim Heald. You may also contact Jim Heald, or the Veridian Development Team if you would like to make a suggestion to improve the tool or give your feedback on how the tool is working for you.

Hardware Contact Beltsville, Maryland USDA Hardware Support
http://www.sci.usda.gov/cce/people.html
Software Contact
Contact Jim Heald 202-720-0787

SDA FSA GIS Tool Problem Report

Identified by: [Name(s)]	Problem Title: [Put a title here – e.g. "Right mouse click disappears"]	Date Submitted: [Enter date here]
Phone #: [phone # here]	Email Address: [Name@usda.gov]	Needed by: [Date when needed]
Unique ID #: [USDA WDC use only]	Error message (exact words):	

Description of problem:
[Provide description of problem here – add attachments as needed]

Condition when error message was received:
[Provide software name, version, tool name, action performing]

Developers Review

Reviewed by: [Persons name]	Revised Title: [Put a more meaningful title here – if needed]	Date Resolved: [Enter date here]

Recommendation:
[Provide description of course of action here along with who assigned to – add attachments as needed]

Issues:
[Provide description of issues here – e.g anything that needs to be approved]

Final resolution:
[Provide description of resolution here]

End – of – Course Evaluation

Training Date _____

Training Location_____

Name of Trainer:

<u>Instructions:</u>

Your feedback is important. The information you provide will help to improve the training course.
Select the ratings that best describe your response to each statement using the following scale.

Rating	Description
5	Strongly Agree
4	Agree
3	Neutral
2	Disagree
1	Strongly Disagree
N/A	Not Applicable

#	Evaluation Questions	5 4 3 2 1 N/A
1.	The course content was well organized.	
2.	The course length was appropriate.	
3.	The handouts were helpful.	
4.	Instructors offered assistance to aid learning.	
5.	Instructors were responsive to student needs.	
6.	I am a frequent user of the GIS.	
7.	The course was the right level of difficulty.	
8.	The course met my expectations.	
9.	I will be able to use what I have learned in my job.	
10.	I will use the CLU Digitizing Tool often.	

Comments